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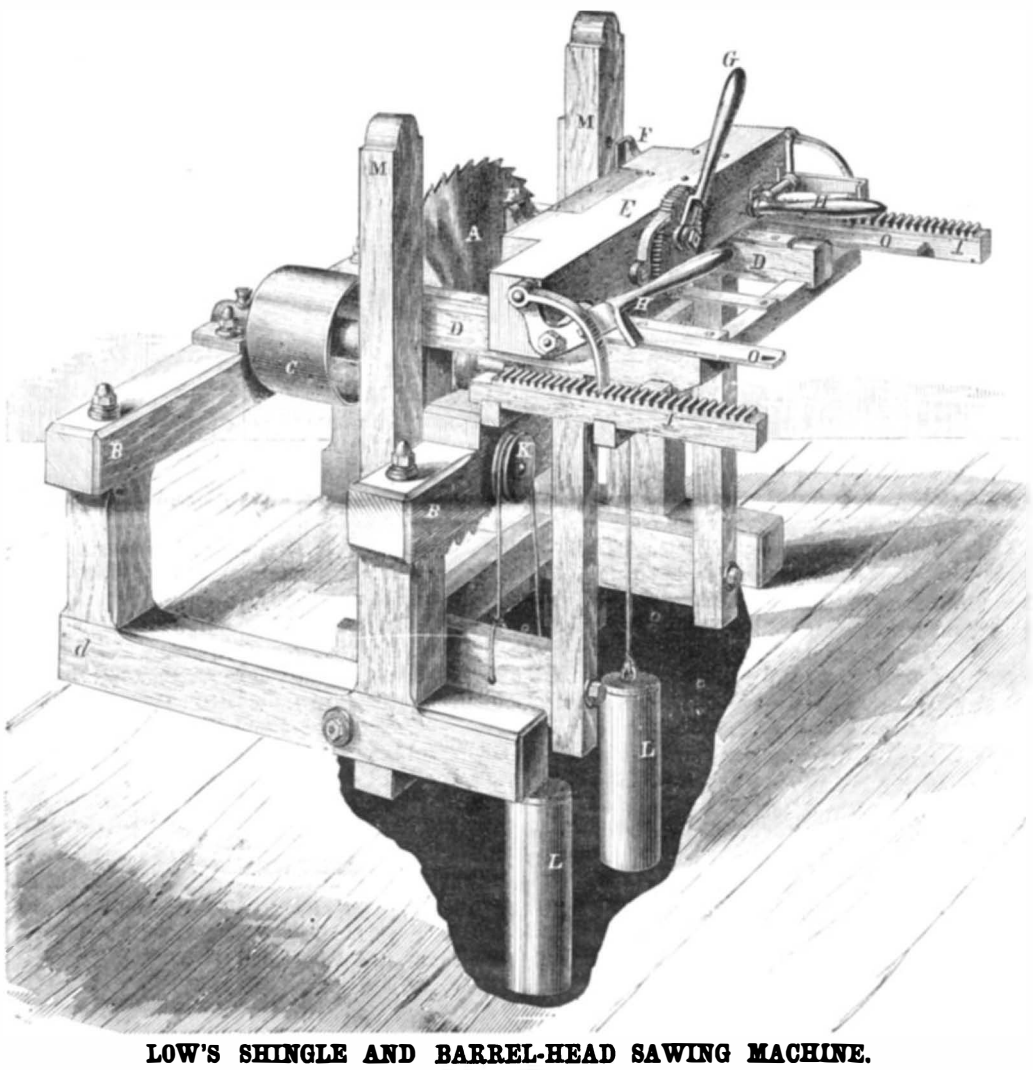
Improved Shingle and Barrel-head Sawing Machine.

No department of industry, in a comparatively new country like ours, is of more general utility and importance than that pertaining to the manufacture of wood into the thousand-and-one forms of usefulness which wood can be made to assume. Slate has not, even in our large towns, yet usurped the use of shingles for roofing purposes, and the covering of buildings with tin or patent roofing is confined in its employment. In the newer and the more rural portions of the country where the material is easily and cheaply obtained, and water or steam power can be advantageously employed, shingles will continue for a long time to be the favorite material for roofing and weather boarding. The increased demand for short sawed lumber for barrel headings, fruit boxes, etc., makes every improvement in the preparation of lumber for such purposes an important matter.

The improvement illustrated in this article demands the attention of all interested in the above branches of business.



LOW'S SHINGLE AND BARREL-HEAD SAWING MACHINE.

A is a 36 or 40 inch saw, upon a substantial frame, B *b*, and is rotated by means of a band around the pulley, C. M M are the two slide posts on which are bolted the V-shaped vertical slides having opposite guides upon the bolt gate, or carriage, D D, which is counterbalanced by weights, L L, suspended by a five-eighth cord over the shives or pulleys, K K, (one not shown). E is a head block fastened down to the top of the bolt gate by means of gibs and sliding to and from the saw on the slides shown at O O, and is actuated or fed by the latch and pawl handles, H H, and feed rack, I I. G is the handle which operates the dogs at each end of the block shown at F F. There are two wedges, one located on each side of each slide post, in order to keep the bolt carriage perfectly in line with the saw in moving up and down.

In operation, the weights, L L, are sufficiently heavy to keep the bolt gate or carriage elevated above the saw, near the points, M M. The bolt or block is laid upon the top of the carriage, and the dogs, F F, are forced into the end by means of the lever, G, and held there by a latch. The handle, H (shown as raised), is now pressed, when it feeds the block forward over the saw, and at the same time pushes the balanced bolt gate down, the saw cuts up through the block, and straight with the grain, and makes a shingle. Remove the pressure of the hand and the bolt gate rises and is ready for another cut. By moving both handles, H H, at once, straight pieces are sawed, or without taper, for barrel heads, box stuff, etc.

The advantages claimed are simplicity, by which any person capable of keeping the saw in order can run one of these machines as well as a thorough mechanic, sawing from 1,700 to 2,500 shingles per day of eleven hours; the use of a thinner saw than generally employed, thereby saving material by less waste in the "kerf," a bolt being used entirely, one of only three-quarters of an inch thickness at one end by two and three-quarters at the other, having actually been cut with the machine into five No. 1 shingles; absence from danger in operating, and the advantage of sawing always with the grain. For further information, certificates, etc., apply to C. S. & S. Burt, Dunleith, Ill., or to S. J. Ahern, No. 88 Wall street, New York.

Torpedo Experiments in England.

Some torpedo experiments were recently made at Portsmouth, England, on a vessel moored in one of the many small lakes which intersect the shoals of that harbor. The vessel selected for the purpose of the experiment was the old wooden frigate *America*, a vessel that has been "used up" over and over again as a target ship for all kinds of shot and shell fired from the gunnery ship *Excellent*, and also as a target ship for carrying armor plates on her broadsides, when under trial, by the sixty-eight pounder and other guns.

The *America*, when moored in position for the experiment, had at high water about four feet of water under the keel (consequently lying high and dry at low water) and lay over a very pretty nest of torpedoes, which had been laid down in accordance with the wishes of the committee. Thirteen of these were fired in all, twelve being under the ship's bottom, and one projecting from a long spar over the stem of a ship's launch, and under and in contact with the ship's bows. Of the twelve under the bottom of the ship four were charged with sixty pounds of gunpowder, two with fifty pounds, two with forty pounds, one with thirty pounds, two with twenty pounds, and one with ten pounds of gun-cotton.

The charges in every instance were inclosed in cylinders made from one-eighth inch iron, with flat ends. The torpedo held in contact with the ship's port bow by the projecting spar over a boat's stem, was charged with ten pounds of gun cotton, considered equivalent to thirty pounds of gunpowder, was inclosed in a similar iron case to the others, and was held in contact with the ship's port bow about six feet below the water line, the bow of the launch being not more than four feet clear of the bow of the ship. The torpedoes under the ship's bottom were laid at various distances and depths, the furthest off being fifteen feet and the nearest two feet six inches.

The signal was given soon after noon, and the discharge of the twelve torpedoes under the bottom of the ship immediately followed, succeeded in about thirty seconds by that of the single one suspended from the boat's spar under her port bow. The first explosion lifted the ship a good three feet above the surface of the water, fore and aft, an immense body of detached water at the same time shooting upward to a great hight all around her, and falling on her upper deck, together with innumerable pieces of splintered wood torn from the ship's hull by the force of the explosion.

The explosion of the bow torpedo, which immediately followed upon that of the main body, produced, comparatively speaking, a still greater display than did the united twelve under the ship's bottom. The column of water thrown up by the explosion was lifted to a much greater hight than in the preceding instance, and the actual effect produced on the ship appeared to be more decisive.

Thus, while there could be no doubt that the twelve torpedoes under the ship's bottom had sufficiently damaged her to insure her sinking, still no sooner had the bow torpedo been fired than the ship at once dipped her bows deeply in the water with an apparent inclination, had there been depth of water sufficient to raise her stern in the air, to go down

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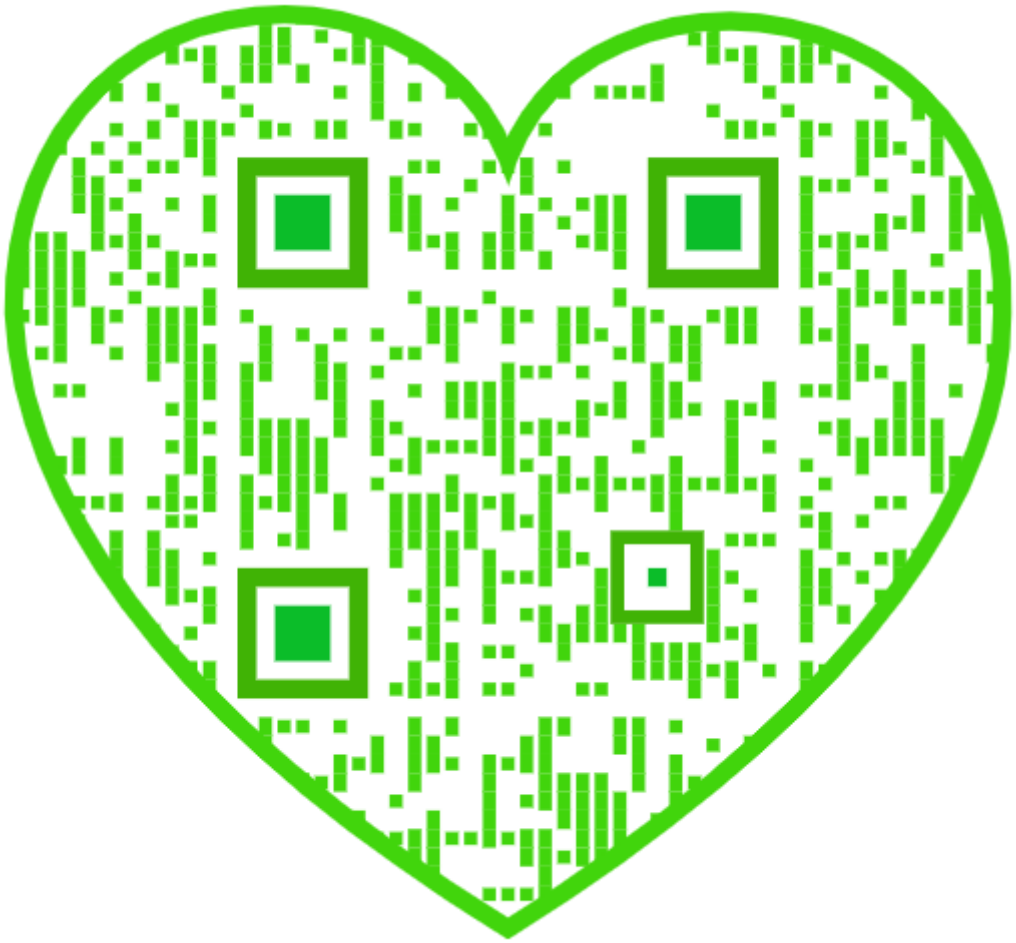

bow foremost. The vessel's keel was on the mud, and the water inside her up to the beams supporting the planking of her main deck in about eighty seconds from the time of the firing of the first torpedoes.

The greatest apparent damage visible immediately after the explosion of the torpedoes, as the ship lay on the mud, with the water inside her level with the hight of water outside, was forward, where, to some distance abaft the fore hatchway, the keel of the vessel was evidently broken in two, the deck there being settled down at various angles, and the beams broken by the collapse and severance of the vessel's frame.

Inside the ship the real amount of the damage was something frightful to look at. Every part of the ship appeared to have been shaken out of place in a most extraordinary manner, and forward, the unsafe state of the decks, with huge pieces of splintered beams quivering overhead, made it a matter of considerable peril to venture there. This was, perhaps, not altogether the effects of the shock given by the explosion of the torpedoes. The explosion had been the immediate cause of the damage, but the latter may have been completed by the vessel striking the ground heavily with her keel in the "send" of the water, when she fell again from her lifting up by the explosion. The main and lower decks of the ship now lie driven up in three huge transverse furrows from the after-hatchway forward, at angles at from twenty to thirty degrees, the sides of the ship stand away from the deck beams, and all is perfect wreck. It is almost impossible for any vessel to have been more effectually or suddenly destroyed, at the same time that the difference in the appearance of the damage from the inside and the outside of the ship is most remarkable.

UTILIZATION OF REFUSE MATTER.

For the Scientific American.

In a country like ours overflowing with the riches of nature, we are apt to disregard the wise old saw—"a penny saved is a penny earned."

The experience of the last decade has fully demonstrated the fact, that treasures lie hidden in the so-called worthless refuse of our manufacturing industry; in proof of which assertion may be mentioned the dazzling aniline colors which come from the very source that supplies oil of almonds or nitrobenzole, used in the almost endless requirements of the toilet. There are a great many matters despised and thrown away by manufacturers which ought to be preserved.

We will direct our attention to the utilization of waste in the manufacture of

SODA AND CHLORIDE OF LIME.

In order to utilize the bulky waste matter from the manufacture of soda and of chloride of lime, the liquid acidulous offal from the production of chloride of lime is exposed to rest for a sufficient period of time to deposit such solid bodies as are suspended in the same. They are next withdrawn into tanks and there mixed with the exhausted residue from the manufacture of soda, in sufficient quantities to neutralize the free chlorine, and to reduce the chlorates of iron and manganese to chlorides. During this operation sulphur is deposited, and may be collected, while small quantities of sulphureted hydrogen are formed, which are conducted into a mass of hydrated oxide of iron, and are there absorbed.

The liquid thus freed from chlorine, but still acidulous, is run into other vats and neutralized with the refuse of the soda manufacture. The sulphureted hydrogen, arising in considerable quantities, is burnt in such a manner as to produce water and sulphur, or water and sulphurous acid.

The waste in the manufacture of soda consists of sulphuret of lime and lime, in the proportion of two of the former to one of the latter. Exposed to the air this sulphuret of lime is changed into bisulphuret and caustic lime. This may be illustrated by the following formula—

$$2\,(Ca\,S)+O=Ca\,O+Ca\,S_2.$$

The bisulphuret next becomes oxidized to hyposulphite of lime, as shown in the following formula—

$$Ca\,S_2+3O=Ca\,O,\,S_2\,O_2.$$

This salt in turn is changed again, on drying, into sulphite of lime and sulphur, as shown in the following formula—

$$Ca\,O,\,S_2\,O_2=Ca\,O,\,S\,O_2+S.$$

This sulphite is again rapidly oxidized into sulphate of lime, the remaining sulphur changing anew some sulphuret of lime into bisulphuret, and sometimes even into polysulphurets. The sulphuret of sodium suffers similar changes. Heaps of this material, when exposed to the rain, are to a great extent dissolved by it, producing a yellow or orange-colored alkaline liquid, containing the sulphurets and hyposulphites of lime and soda. This liquor, injurious to animal and vegetable organism, may be advantageously made into hyposulphites and sulphur, by exposure to the sun in thin layers, where it becomes oxidized, or by treatment with sulphurous acid gas. It may also be used for the precipitation of chlorides of manganese and iron, when the precipitate will consist of sulphurets, mixed with sulphur, or of polysulphurets, which may be burned to advantage for the manufacture of sulphuric acid. This manner of utilizing the refuse matter is employed by Kopp, who recently mentioned it to the French Academy.

In some parts of Germany, a slightly different plan is pursued. The refuse matter is oxidized by exposure of air for several weeks, when it is exhausted, the resulting liquors possessing a strength of 10 to 15° Baume. It is then decomposed with muriatic acid, which precipitates sulphur and gypsum, and being heated with water in a closed vessel to 230° or 240° Fah., is deposited, while the sulphur melts, separates from the limy substance, and crystallizes almost perfectly pure.

The chloride of manganese, resulting in the manufacture of chlorine, and which contains six to eight per cent of muriatic acid, may be used for the production of sulphur from the refuse matter of the soda manufacture.

UTILIZATION OF BLOOD.

Among the offal—the accumulation of which is much dreaded during the warm season, especially with an apprehended epidemic at our doors—blood ranks the highest, and being produced in enormous quantities in our populated cities, and liable to rapid decomposition, ought to be consumed entirely, and not allowed to contaminate the air by being run off through the gutters of our streets.

In Chicago, where over a million of hogs are annually slaughtered, the blood runs into the river, which has gained for it the unenviable reputation of being the most intolerable disgrace of a large city, rendering it not only filthy but exceedingly unhealthy. In that city, in place of being a continuous source of annoyance and necessitating the digging of the lake tunnel for the procuring of pure drinking water, the wasted blood might have been productive of capital large enough to pay for the tunnel itself, if it had been used and disposed of in a rational manner. A small portion of blood is used by sugar refiners for clarifying, though it frequently becomes annoying in summer, when it turns putrid within a few hours.

The use of the blood proposed is for the production of albumen and prussiate of potash, both of which are always in demand, commanding a fair price, and which we now import from Europe, while we have the facilities for supplying more than our own demands for those articles. Blood was tried in Europe for the manufacture of prussiate of potash, but was not liked on account of its liquid state, which necessitated tedious evaporations. It was also tried for the manufacture of albumen, but the product was always black, owing to the incomplete separation of the coloring matter, and therefore only fit for clarifying purposes, possessing a comparatively small value.

The process given below was recently patented by A. H. Hirsh, of Chicago, Ill., and produces a very thorough separation, keeping the liquid albumen light colored, and concentrating the nitrogenous solid coloring matter of the blood into a firm substance, which by itself, or mixed with other animal offal, may be turned advantageously into prussiate of potash. For this purpose the blood, as it runs from the slaughtered animals, is collected in large tanks and is there stirred with water, charcoal, and chemicals, preventing the emission of offensive odors, which renders the manufacture possible in cities even during the warm season. The liquid is allowed to settle, or it is passed through a centrifuge, which retains the coloring matter and other solid parts of the mixture, while the serum passes through the centrifuge. As a matter of course, it requires some practice to select the proper filtering cloth for the centrifuge fine enough to prevent the emission of coloring matter, and coarse enough not to be clogged by the albumen. The pure serum is then evaporated in a vacuum pan or a peculiarly constructed evaporator, which in a short time renders the albumen dry and brittle, and preserves its color, so that it closely resembles the albumen prepared from eggs. The colored solid part of the blood is then placed into so-called carbonizers, where it is transformed into animal charcoal, and is then treated with iron and potash in proper equivalents to produce the prussiate of potash by calcination.

The calcined salt is purified by repeated crystallization. The process also uses the blood cake for the same purpose, without carbonizing it, and employs, during calcination, gas water as an additional source of nitrogen, which increases the quantity of the resulting cyanide. The blood produces on an average six per cent of albumen, and four of the prussiate, although the relative quantity of the two products changes with the kind of blood employed. After exhausting the calcined prussiate, sulphurets of iron and potash remain as a residue, which may be turned advantageously into sulphuric acid.

The albumen is largely employed in animalizing fabrics, to render colors fast, but must, of course, especially for light colors, be pure. It may also be used for clarifying sugar in place of blood or eggs, where it has the advantage of being unaffected by age, if it is properly kept dry, which is especially of benefit in the hot climate of the South, where the manufacture of refined sugar is being established. The use of prussiate of potash, for the production of the so-called prussian blue, of ink, is well known.

Cast-iron Projectiles.

The American Army Ordnance Bureau has adoped, as the lowest limit of tensile strength in cannon projectiles, 24,000 lbs. to the square inch. This, says a correspondent of the American *Army and Navy Journal*, precludes the possibility of making shot or shell from the casting of a cupola furnace, unless charcoal is used in smelting the iron, and will compel founders to resort to the reverberatory furnace to secure the required strength. It is believed now that if any future orders are given for the manufacture of shot and shell, only the very best quality of gun iron will be used—that is, cold blast charcoal iron—and that they will be required to be cast from a reverberatory furnace, which will produce iron of a much better quality than when remelted in an ordinary furnace. Several accidents occurred during the war in consequence of the breaking of projectiles before leaving the gun, caused by the simple force of the gases acting on the worthless iron, breaking it into fragments. At least one officer lost his life by standing too near the range of the gun, when a fragment of a shot, thus broken and thrown out of the range, struck him in a vital part.

The journal above quoted observes that it is very plain that this statement is true enough if cast-iron projectiles shall continue to be used against ironclads; but, of course, against wooden vessels there is no necessity for any finer iron than has heretofore been employed. It is, however, pretty clear that if the Americans are going to adopt the heavy charges of powder necessary to produce decisive results in ironclad warfare, they must use steel for projectiles, a fact which experience has abundantly proved. What their iron founders need to do now is to put up some of Bessemer's converters, and then they will have projectiles really worth discussing.—*Mechanics' Magazine.*

THE TURRETS.—We understand that the Admiralty have resolved, in order to test as fully as possible in times of peace the turret principle, as fitted with the revolving tables and wheels on Captain Coles's plans, to fire a steel bolt at one of the turrets at short range from the Armstrong 10-inch or 300 pounder rifled 12-tun gun, now on board the iron-armored frigate *Bellerpohon*. The day is not yet fixed for the experiment. This suggestion was made some time since, in the debates on the navy estimates, and it is indeed time it was carried out.—*London Engineering, May* 18.

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BRIDGE BUILDING—THE BRIDGE OF THE HARTFORD, SPRINGFIELD AND NEW HAVEN RAILROAD OVER THE CONNECTICUT.

Brown & Gross, of Hartford, have published a pamphlet giving a description of the new iron bridge over the Connecticut River, at Warehouse Point, on the line of the Hartford, New Haven, and Springfield Railroad. The pamphlet contains also a brief history of iron bridges. The bridge replaces a wooden structure on stone piers, and was built on the old piers with the addition of several new ones in the same line, so that the present structure occupies the exact site of the former one, and during the seven months of its construction no delay of trains was caused by the work. This is remarkable when the magnitude of the work is considered. The bridge is 1,524½ feet in length, composed of 624 tuns of wrought iron, the flooring only being of wood. In its construction 175,000 rivets were used. The cost was $264,784 63, and it is capable of bearing a strain of two and a half tuns to the foot. The iron work was made in England by Fairbairn & Co., of Manchester, and the London Engineering and Iron Ship Building Company. The plans and designs were by James Laurie, Civil Engineer, of Hartford, Conn. It is the largest work of the kind in this country.

The subject of bridges, those which are incombustible, is as important a one as any that can engage the attention of our practical men. Wooden bridges seldom pay for the cost of their construction. On railways their tenure of life is only ten or twelve years. In time of peace these bridges are constantly exposed to destruction by fire—accidental sparks from the locomotive, or the stumps of cigars thrown from smoking cars; and their lightness gives the wind a tremendous power to unseat them. In this case (over the Connecticut) a wooden bridge was thrown bodily from the piers in October, 1846. The danger of weakening by decay adds to the insecurity of wooden bridges. Frequently, also, their location, remote from dwellings where the incipiency or progress of a fire cannot be observed, renders wooden bridges for railways really expensive structures.

For this class of bridges cast iron is unfitted, as no cast-iron bridge can sustain its own weight when suspended between piers at the distance apart that is often necessary on railroads, unless it is arched. Frequently it is impossible to provide springing points for the arches at a sufficient distance below the roadway to give a level surface for the rails. For ordinary travel, cast iron can be used in the construction of bridges, but most engineers prefer, for railroad purposes, wrought iron.

On our railroads, both the roadways and the bridges, have been built more to accommodate a present demand than to provide for future requirements. The result is, that a large portion of the earnings of the roads have been required to repair or replace work, which, if properly performed at the outset, would have remained *en permanence*. The system is a foolish and wasteful one. If the roads reaching from the loyal States into the South, during our war, had been provided with substantial wrought iron structures, much less damage would have been inflicted upon them than where the application of a match, with some combustible material, would insure the destruction of a connection between the two banks of a river.

The delay and inconvenience to travel is another reason why the bridges on our railroads should be of a permanent character. The annoyance and trouble caused by the burning of the Coscob bridge, on the New York and New Haven Railroad, a few months ago, is fresh in the minds of all. We hope the construction of the Connecticut River bridge will serve as an impetus to our railroad companies to replace the present wooden structures with permanent works; the country needs them, and the best interests of the railroad companies demand them.

When gunpowder is heated nearly up to the point of decomposition, previously to ignition, the force of its explosion is greatly increased It is stated that a temperature of 160°, Fah., increases the force of the explosion one-fifth, while a temperature of 400° nearly doubles it. This may in some measure account for the fact that highly heated guns are liable to burst, if the charge has been allowed to remain in the chamber a sufficient time before firing.

New Method of Copying Pictures.

The last number of the *British Photographic Journal* comes to us with a specimen illustration of a novel mode of copying and reducing pictures, which is remarkable for the excellence and accuracy of the reproductions. Upon a single sheet, equal in size to a page of the *Journal*—which is a trifle less than a page of the Scientific American—we have an original lithograph picture reduced to a very small compass, followed by three *fac similes*, each of different dimensions, and each comprising the printed matter of an entire page of the *Journal*. One of these pages is reduced from a superficies of 73 inches down o 3⅔ inches, yet every word in the page may be easily read.

The following is the process:—

"A sheet of india-rubber of the thickness of cardboard is fixed by the edges to a suitable frame, the mechanism of which is so constructed as to cause, by the simple operation of turning a handle, the web of india-rubber to be expanded equally in every direction and to any extent. Of the very ingenious mechanism employed for this expansion it is unnecessary for us to speak; let it suffice to say that the action is very uniform and under control. The four sides of the frame to which the elastic web is attached, recede from or approach to each other by manipulating the adjusting screw in one corner. If, when the elastic sheet is expanded, an impression be printed on its surface by means of transfer ink, it is obvious that when the sheet is allowed to contract to any given extent, and the print be then "set off" or transferred from the rubber to a new and polished stone, the resulting picture will be a perfect and reduced *fac simile* of the original. This reduction is much more perfect than could be produced by any artist, no matter how accomplished he be; and coarsely executed work, such as that of the commonest wood engraving, may thus be made to rival the finest steel engraving, so far as fineness in the lines is concerned.

"Impressions from wood engravings and type become exceedingly valuable by means of the Pentagraph, as these, when reduced on stone, produce exquisite results, and can be altered to suit every purpose without reference to original size; thus effecting immense saving in labor and time, as evidenced in the present illustration.

"The practical value of this invention to a lithographic establishment, may be briefly stated in a few words; for instance, a bill-heading, after being once engraved, and transfers made or impressions taken upon the elastic transfer medium, can be altered and transferred to stone to fit any size of paper. Show cards can be reduced to print as business cards. Transfer impressions taken from wood engravings or type, reduced and transferred to stone, yield printed copies as fine as engravings; crayon, or chalk drawings, when drawn to an enlarged scale and printed on elastic transfer medium, and reduced when transferred and printed from stone are superior to any thing that could be done by the ordinary mode, and this is the only process by which duplicate transfers of chalk drawings can be accomplished that yield impressions superior to the original drawing. Engravings executed to a medium size may be used for obtaining reductions and enlargements, also contorted or metamorphosed, and used for any desired purpose, without the expense of engraving duplicates for each size. Manufacturers using various sized package lables or tickets may have their show cards reproduced as labels for each packet, as suitably as if engraved for the purpose, but possessing this great advantage, that each label, though different in size, presents the same character, thereby rendering imitations difficult and more easily detected."

MISCELLANEOUS SUMMARY.

The London *Mechanics' Magazine* says that Captain Coles has selected Messrs Laird out of six firms suggested to him for building his new cupola ship These gentlemen have already built six of this class of vessels. There are now nineteen turret ships built or building.

Dolomite, or magnesian limestone, calcined at a lowered heat and powdered, and then made into a paste, forms under water a stone of extraordinary hardness.

Tight Alcohol Barrels.—Barrels or casks designed to be filled with alcohol, may be made tight by the application of the following solution:—Dissolve in a water bath 1 pound of leather scraps and 1 ounce of oxalic acid, in 2 pounds of water, and dilute gradually with 3 pounds of warm water. Apply this solution to the inside of the barrel, where, by oxidation, it will assume a brown color and become insoluble in alcohol. This coat closes all the pores of the wood and does not crack or scale off.

Cure for Hydrophobia.—The Leeds (Eng'and) *Times* says that the nitrate of silver rubbed into the wound made by the teeth of a mad dog will certainly cure hydrophobia, or prevent all injurious consequences of the wound. It should be applied as soon after the accident as may be. In six weeks the virus is disseminated through the system and then hope is gone. Youatt says he has been bitten eight or ten times and always cured himself by this means.

Losses of the South.—Robert Tyler, in a recent letter, estimates the losses of the Southern States as a result of the war, at the enormous sum of $3,500,000,000, which includes the item of $1,700,000,000 for emancipated slaves. He thinks that in the whole history of war such an immense loss has never been so suddenly and completely suffered by a country containing not more than six millions of people responsible for government and property.

The presence of a mineral adulteration of flour or meal may be readily detected. A small quantity of the suspected flour is shaken up in a glass tube with chloroform. All mineral adulterations will collect at the bottom, while the flour will float on the liquid. In this country, where the comparative cheapness of flour makes adulteration unprofitable, this test may not be valuable; yet the fact may not be without interest.

The small steel chain that winds round the fusee of a watch is about 8 inches in length and contains about 500 links riveted together. Modern invention has as yet discovered no substitute for this chain equal to it in slenderness, strength and flexibility. The links are punched out by girls from plates of steel and riveted one to the other.

An iron ore of peculiar character has been discovered in Ireland. It has much the appearance of plumbago, leaving a greasy stain when rubbed between the fingers. It was unacted upon by the blow pipe, and contained no carbonaceous matter. Its composition is, ferric oxide, 90·5; matter insoluble in HCl and NO_5, 9·5.

The London *Engineering* says that in the Paris exposition but 70,000 square feet of space can be allotted to British exhibitors, while the applications are for upwards of 300,000. In the case of the Americans, Messrs. William Sellers & Co., of Philadelphia, have applied for more space than the whole quantity allotted to the United States.

The sugar lands which lie along the banks of the navigable streams in Louisiana are now chiefly devoted to cotton. During the war a good deal of the necessary machinery was destroyed, and much of the plant cane was lost. The planters have not had the necessary means to renew their material, and consequently sugar ceases for the time being to be a staple product of Louisiana, notwithstanding the fact that she was once the third sugar-exporting country in the world.

Gunpowder Marks.—Dr. Davies, in a recent number of the London *Lancet*, states that he has found the following treatment most successful: smear the scorched surface with glycerin, by means of a feather, then apply cotton wadding; lastly, cover with oil silk. In one case the discoloration was very great, the patient looking more like a mummy than a living being. It entirely subsided in a month by the above treatment.

Northern capital is pouring into East Tennessee and especially into Knoxville and Chattanooga. New houses and factories are springing up, and farms are being purchased by farmers and army officers. Several extensive steam saw mills, iron founderies, and a large cloth manufactory, are projected at Chattanooga.

A new textile plant has been discovered in Mexico. Its fibers are extremely long, having the appearance of those of hemp, but are much finer. By chemical means it may be reduced to perfect whiteness and the waste may be worked into a pulp for paper.

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NITRO-GLYCERIN AGAIN---HOW TO MAKE IT SAFE.

BY PROFESSOR CHARLES A. SEELY.

The public interest in nitro-glycerin is still kept fresh by more terrific explosions;* the wonderful power of the new agent of destruction has now been felt in all quarters of the globe. Nitro glycerin has already cost us millions of property and nearly a hundred lives—very valuable, indeed, must it prove, to be worthy of such sacrifices. Would it not be well to banish it at once and forever? Should not even the possession of it, under any circumstances whatever, be made by statute, a penal offense? I confess that I should answer yea, unhesitatingly and heartily, were I convinced that the nature of nitro-glycerin cannot be understood, and that its power to destroy cannot be controlled.

In an article on this subject in the SCIENTIFIC AMERICAN of May 5th, I made the assertion that the dangers from nitro-glycerin are preventable, and that sure means were known by which its transportation and storage could be made safe. I shall now describe the most perfect of the plans proposed, and I ask that those who are interested in the subject will carefully weigh them.

First, Mr. Nobel proposes to dilute the nitro-glycerin with wood naphtha. These two liquids mingle in any proportion, and the explosibility of the mixture may be reduced to any desired extent. Probably a mixture containing about 25 per cent of naphtha could not be made to explode by percussion, or gradual heating. When the nitro-glycerin is required for use, water is added to the mixture and takes from it the naphtha, while the pure nitro-glycerin sinks to the bottom. This plan is, however, liable to serious objections. 1st. The expense of the naphtha and loss of nitro glycerin in washing with water. 2d. The volatility of the naphtha: whenever the mixture is exposed to air some of the naphtha escapes and the nitro-glycerin might be left unprotected. 3d. It is probable that there would be a chemical action between the substances. 4th. The naphtha and the vapor from it are very combustible. The vapor mixed with air would be an explosive mixture.

Second, It has been proposed by several persons quite independently of each other, to keep the nitro-glycerin mixed with sand, or other inert substance which should serve as a conductor of heat, in the same way as the glass powder in Gale's gunpowder mixture. This plan would greatly increase the weight and bulk of packages, and great loss would be sustained by reason of the adhesion of the nitro-glycerin to the sand.

Third, Dr. Henry Wurtz proposes to make a thorough mechanical mixture or emulsion of the nitro-glycerin with a saline solution of the same specific gravity. A solution of nitrate of zinc, lime, or magnesia, will probably be found to be suitable. When the nitro-glycerin is needed for use, water is added to the mixture when the oil subsides and may be drawn off. Further experience seems to be needed to determine how long the mixture may be maintained without spontaneous separation.

Fourth, I have proposed to prepare the nitro-glycerin more carefully, in order that it shall be perfectly freed from acid; and to prevent any future accumulation of acid, I propose to keep suspended in the oil a small quantity of a substance in powder which shall neutralize any acid which may be generated, and which of itself shall have no action on the oil. This method is offered as an efficient prevention of spontaneous decomposition. The amount of neutralizing powder required is very little—60 grains to the lb. of oil might be sufficient. The quantity is so small that it would not interfere with the use of the oil, and need never be removed from it.

In actual practice one or more of these plans may be combined. The fourth is compatible with all the others, and should be used with all the others; nitro-glycerin should not be kept in storage unless it is free from the danger of its most formidable property—the liability to spontaneous change.

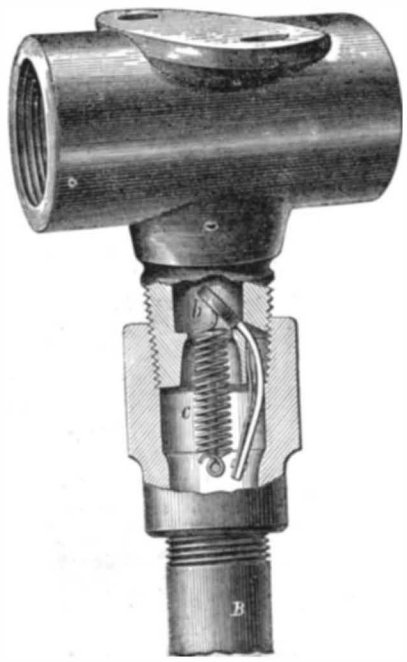
In conclusion I can say that I have as yet had no reason to modify the opinions which I expressed in my communication of May 5th, and that I still hold that the manufacture, transportation, and use of nitro-glycerin may be carried on with safety. I believe all the careful and thoughtful readers of this article will agree with me.

*In Australia and England.

JACOB'S SAFETY GAS VALVE.

This device is intended as an automatic preventive of the escape of gas into a room from an open pipe caused by the accidental or intentional detachment of the parts. In making repairs on the pipes supplying a building, the gas-fitter screws on a cap to the open end of the pipe; but this invention is intended to obviate the necessity of this, but more especially to protect the inmates of a room from fire or strangulation in case of an accidental rupture of the parts of a pipe.

In the engraving, A represents a T or nipple on the ceiling of a room to which the drop pipe, B, is



connected in the usual manner. Secured to the inside of the joint is a small valve, *b*, connected to a spring shutting in a slot on the thread of the nipple. When the connecting pipe is detached the spiral spring, *c*, closes the valve firmly against the orifice, preventing the escape of gas. When the thimble connecting the T and pipe is screwed on, it shuts the side spring which projected beyond the thread and closes it into the slot, thus overcoming the resistance of the spiral spring and keeping the valve open.

This invention was patented through the Scientific American Patent Agency on May 22, 1866, by Auguste Jacobs, No. 171 West 28th street, New York.

New Music Hall.

Messrs. Steinway & Sons, the celebrated pianoforte makers, are now erecting, on East Fifteenth street, a splendid Music Hall adjoining the rear of their ware rooms, which will, when completed, be an ornament to the city. The corner stone was laid on the 26th ult. by Mayor Hoffman, with appropriate ceremonies. It is to be 123 feet deep and 75 feet wide and 43 feet high.

The basement walls are granite, three feet thick, the first story walls two feet eight inches, and the walls of the concert hall 28 inches thick from floor to ceiling, with heavy supporting columns, all laid in cement. There are two center walls, running the entire length of the building from the foundation, directly under and supporting the beams of the concert hall floor, each wall 20 inches thick. The stage will be placed at the end fronting Fifteenth street, and the main entrance will be from Fourteenth street; but there are also two doors of exit, each seven feet wide, on either side of the stage, leading directly into Fifteenth street—thus allowing the hall to be emptied in a very short space of time. Fronting Fifteenth street, and along the westerly side of the hall, an additional building is being erected, containing the artists' dressing-rooms, even with the stage. The upper story will contain the wind chests, and some of the heavy work of the organ. There will be two galleries (one above the other) at the end of the hall toward Fourteenth street, which will extend on either side of the hall about one-third of its length only. The hall will be finely decorated, and lighted and ventilated in the best possible manner. It will be heated with steam, the steam generator being located outside of, and some distance from, the building. The front, on Fifteenth street, is being built of the finest Philadelphia front brick, with brown stone trimmings and finely ornamented pillars and caps. Connecting with the main hall is a large room in the second story of the front building, twenty-five feet wide and eighty-four feet deep, affording room for 400 persons, so that there will be ample and comfortable sitting room for 2,500 persons. The fine organ from St. Thomas's Church, of thirty-two stops, has been purchased, and will be fitted up to serve temporarily until the grand organ is finished. On the whole, it will be one of the finest and most elegant Concert Halls in the country, worthy alike of its proprietors and of the metropolis.

CIPHER WRITING.

An Ohio correspondent sends us a table for cipher writing, which is one of the oldest forms of secret communication. It consists of the alphabet arranged in parallel lines, horizontal and vertical, the only secret being an understanding between the two parties as to the key word or words, which may be changed indefinitely; as for instance, the first words or address of a communication being located over the table as a key to correspond with the letters in the body of the epistle. It makes a pleasant pastime, and can, perhaps, be turned to account in important matters. The value, however, depends entirely on previous agreement between the parties in communication.

This subject seems to have awakened considerable interest, and we were about to prepare a brief article in relation to it when we received the communication published below. Mr. Round is the only correspondent who has succeeded in translating the cipher message of our Norfolk correspondent, published in our issue of May 26th. His translation is *verbatim et literatim*. Probably our readers will find the task he sets them a most onerous one, as he seems to be a master in the occult art of cryptography. [EDS.

WESLEYAN UNIVERSITY, Middletown, Conn., May 28, 1866.

MESSRS. EDITORS:—I notice in your issue of the 26th, a rebel message in cipher. Translated it reads as follows:—

"The President deems it advisable that you should be charged with the military operations on both banks of the Mississippi, and that you should endeavor as promptly as possible to cross that river with as large a force as may be prudently withdrawn from your present Dept. You will accordingly extend your command to the east bank of the Miss., and make arrangements to bring to this side such of your present force as you may deem best."

I had never met this particular cipher before, but the general principles upon which the rebel ciphers were founded have been long known at the Signal Bureau at Washington, having been first discovered by Geo. H. Stone, now a student at this University, then belonging to the Signal Detachment of the Department of the South.

Your correspondent promises us a cipher which cannot be translated. By all means let us have it. Such things are very rare, particularly if they are simple enough to be of use.

Your correspondent remarks that he has never seen a cipher in public print which could not be translated. I would refer him to a challenge message which Col. A. I. Myer, formerly of the Signal Corps, published last winter in the *Army and Navy Journal*. It remained before the public three months untranslated, although a reward of $50 was offered for its solution.

To test the skill of your readers I append a short message, for which I challenge a translation, by any one who has not been connected with the Signal Corps. Perhaps Mr. D., of Chicago, who knows so much about signaling, will deign to give us the key.

TZLDUJL—TRJLYLY—JYRLLYR—INGLYWL—YINGBSX—VXIOLUJ—PJXAWPB—OICBWKM—YXIDTIC—RWCLTVN—QLTIING—LYKRYXD—IEZVFEQ—XIIFQCT—BOBTION—JKZBGHW—PJ&IZTI—ONSCSPQ—VNVZAXF—XRMTXIB—LETION R—BYBYYHY—LYXVZAA—NDPVFRT—YJIFLNH—VMSOQWS.

Accompanying this you will find the translation.*

GEO. C. ROUND,
Late Lieut. and Signal Officer, U. S. A.

[The translation is reserved.—EDS.

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GLEANINGS FROM THE POLYTECHNIC ASSOCIATION.

The subject of roofing was again taken up, but no new facts elicited. The merits of the so-called plastic slate roofing were discussed at some length and decided to be no better than other similar compositions. Mr. Hirsh mentioned the use of liquid glass in Europe in the preparation of felting for roofing, which rendered it comparatively fire-proof.

NITROUS OXIDE.

Dr. Wright then referred to the unscientific manner in which the nitrous oxide had been applied at a previous meeting and in which it was being used by a number of physicians, the same being contaminated by carbonic acid after a few respirations by the patient, whose unconscious state was, in such a case, as much due to asphyxia, as to the anesthetic. This was plainly shown by the leaden hue of the face, the rigidity of the muscles, and all the other symptoms of asphyxia, presenting themselves in a greater or lesser degree in the common application of the gas. The Doctor cited cases, where the ill effects of this treatment had been felt for days and even weeks. The breath of a gentleman, taking a few gallons of the gas in this method, was passed through lime water and an abundant precipitation of the carbonate showed the great amount of carbonic acid, produced by a few inspirations. He then exhibited an instrument which prevents the reinhalation of the carbonic acid. It consists simply of a short tube or mouth-piece, which is screwed on to the gas bag, and which has two india-rubber valves. One of these opens from the bag into the tube and admits the gas into the lungs at every inhalation, while the same current of gas closes the other valve, on the side of the mouth-piece mentioned, the latter, opening at every exhalation, giving free egress to the carbonic acid, while the same current closes the valve communicating with the bag. In this manner the play of the valves continues similar to those in bellows. The Doctor next showed an instrument, by which, with the addition of the first, the gas is breathed through the nose, when the mouth may be left entirely or partially open. An experiment with the application of the gas in this manner showed that the insensibility was produced as effectually as in the old method, while none of the signs of asphyxia, mentioned before, were present. The mouth in this case can be opened at pleasure without the use of a cork or piece of rubber, the muscles not being rigid, and the patient, although aware of what is going on, is not sensitive to pain.

Dr. Richards next presented an instrument, invented by Dr. Richards, of London, and used for freezing any part of the body to insensibility to pain by means of a spray of ether. The instrument consisted of a four-ounce bottle, having a small tube reaching close to the bottom, and surrounded outside of the bottle, where it is bent under an angle by a somewhat wider tube, ending at about the same place with the narrow inner tube, into a small opening. This wider tube is connected with a short rubber tube, having two rubber balls at its end. In using the instrument the bottle is filled partly with ether and the balls compressed in the hand. They, acting like a common rubber syringe, blow air into the bottle, while part of it passes through the wider tube mentioned. The air in the bottle forces a stream of ether through the narrow tube, which, on leaving the orifice, is mixed with the air, coming from the surrounding wider tube on the same spot, and is thus blown in a spray upon the part to be treated. The rapid evaporation of the ether, aided by the air current, freezes the parts within a few moments to perfect insensibility. The Doctor related some very astonishing operations which were safely performed by this method.

ELECIRIC FORCES.

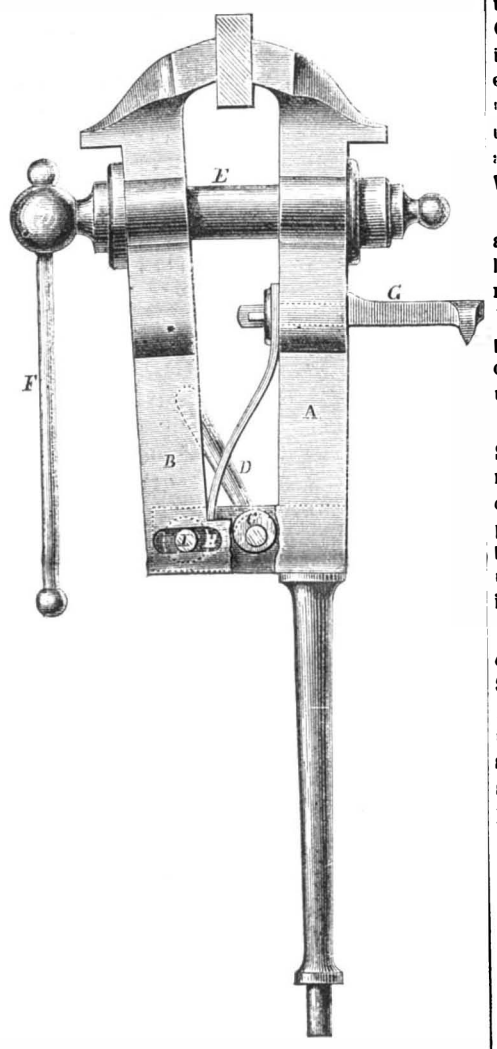
Dr. Bradley then referred to his remarks at the previous meeting, that the tangents of electric forces were in proportion to the strength of the current, and said, upon actual experiments he found, that this rule laid down in our books did not coincide with practical results. He was led to believe that a common helix acted only in one direction powerfully upon the magnetic needle, while its influence ceased or was changed with the deflection of the needle according to its distance from the current. He therefore made a coil or helix so large that the needle, in all its positions, was at an equal distance from the helix, and therefore influenced in the same manner. It consists of a brass disk, on the top of which several needles, made of clock-spring steel, are laid parallel to each other, corresponding to the periphery of the disk, so that the outer needles are smaller than the inner ones, forming a grate of needles. In experimenting with this instrument he found, in a great many experiments, that the rule proved correct, the needle being acted upon in the same manner as it is by the magnetism of the earth, which, by its enormous size, acts evenly upon the compass in all its positions.

The meeting then adjourned until September next.

JONES'S BENCH VISE.

This invention consists in providing a cam or eccentric at the lower end of one of the jaws of a vise, so that an increased power may be obtained independent of the screw.

In the engraving A and B represent the jaws of a vise of common structure, except at the lower end



of the jaw, B, is a slot, H, which slides back and forth upon the pin or bolts, I. E is the screw, and F the lever by which it is worked. G is the strap by which the vise is secured to the bench. C is a cam or eccentric provided with a lever, D. When an article is placed between the jaws, and the screw, E has been turned up by means of the lever, F, to its full capacity; then, by turning down the lever, D, by the action of the eccentric upon the lower end of the jaw, B, it is thrown out, and the article in the jaws is held more firmly than by the action of the screw alone.

This invention was patented through the Scientific American Patent Agency, by Richard Jones, on the 3d of April, 1866.

Further information relating to this invention may be obtained by addressing the assignees, Jones & Bromley, No. 127 Marshall street, Paterson, N. J.

Experiments on Iron.

A system of experiments for testing the strength of iron has been inaugurated at the Scott, Pa., Iron Works, by able scientific officers of the United States army, with a view of obtaining an iron of sufficient strength for battering shot. These tests have fully demonstrated that no iron can be had of a suitable strength for railroad car wheels which has been remelted in an anthracite or coke cupola furnace. In fact, the best charcoal iron assumes all the appearance of anthracite iron by such remelting, and the strength of the metal is reduced from the breaking weight of the pig, usually about twenty-four thousand pounds per square inch, to that of eighteen thousand pounds, the usual standard of anthracite iron, while remelting the same iron in a reverberatory furnace would have increased its strength to thirty thousand pounds to the square inch. The apparent excellence of some car wheels made at this establishment has induced the writer to suggest this mode of remelting the iron as the reason.

Manufacturing and Business Items.

NEW LOCOMOTIVE WORKS.—Pittsburgh, situated almost in the center of the coal and iron district of Pennsylvania, and justly celebrated for its numerous and important manufactures, has at last awoke to the fact that locomotives can be manufactured there as well as in Philadelphia. A lot on Beaver street, in the borough of Manchester, having a frontage on the Ohio is being rapidly transformed into a manufacturing center for the building of locomotives. The extent of the concern may be estimated from the fact that it is expected to turn out seventy five locomotives per year. Cost of buildings, machinery, etc., about $300 000. The superintendent is John A. Wright, of Philadelphia.

THE manufacture of ladies' and gents' kid gloves, as many of our readers are aware, is carried on largely at Gloversville, N. Y., by some 15 or 20 manufactories. Flour, salt, alum and the yolk of eggs are used. Thousands of dozens of eggs are consumed in the process, and this fact may account for the high price of this article of food. The whites of the eggs are used for chemical and other purposes.

THE *Charleston Courier* mentions one district of South Carolina that contains more than forty saw mills in operation, a large cotton factory at Vanclase, one at Graniteville, a porcelain factory at Kaolin, a paper mill at Bath, while another cotton factory is building which will accommodate and use nearly a thousand looms; "all of these factories are worked in an area of twelve square miles."

THE Boston and Sandwich Glass Company has a capital of $500,000, and employs at the works in Sandwich about 450 hands. It was established in 1824, and has one of the largest glass manufactories in the country. The works of the company cover several acres of ground, and include two buildings for smelting, each of which contains double sets of cupolas, charged with ten furnaces each.

A LOCOMOTIVE on the Hartford and New Haven Railroad was recently fired with peat found along the line of the road. The experiment was highly successful, the engine drawing several heavy laden cars at fast speed. A company has been formed in New London, Conn., for the manufacture of peat on a large scale.

A SITE has been secured for the projected rolling mill at Milwaukee, Wis. The purchase comprises 100 acres at the mouth of Deer Creek. The mill is to be finished within a year. The yearly expenses of this establishment will be $600,000, and its operatives, with their families, will form a village of 2,000 people.

A LARGE cotton factory, called the "Manassas Factory," has been built at Carrollton, Miss. It contains one hundred and eighty thousand spindles, thirteen hundred looms, and will go into operation July 1. The company owns seventeen hundred acres of land contiguous to the factory, and well wooded.

THE proprietors of the Fort Pitt cannon foundery, Pittsburgh, intend sending a big twenty-inch cannon from that city to the Paris exhibition. It will be 22 feet long, 5½ feet diameter at the breech, and will weigh 50 tuns. When completed it will be mounted on an excellent iron carriage weighing 8 tuns, and will be accompanied with specimens of balls, shells, and cartridges. The cost of this monster will be about $30,000. It requires 100 tuns of melted iron to cast one and fourteen days to cool it off properly.

A LARGE nail factory is now in process of erection in Thamesville, Conn.

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Correspondence

Petroleum and its Products.

[The importance of the subject treated in the annexed article, its valuable suggestions—valuable to life and property—and the indisputable ability and reliability of the writer, will be our excuse for transferring the whole paper to our columns. It was prepared for the SCIENTIFIC AMERICAN by Prof. P. H. Vander Weyde, M.D., late Professor of Chemistry in Girard College, Philadelphia.—EDS. SCI. AME.]

Allow me to give you some information on this subject additional to that contained in your number of May 19th, last. The kinds of petroleum most adapted for distillation have a specific gravity of 0·82 to 0·68, corresponding to 40° to 46° of Beaume's hydrometer. Most petroleum oils are of this kind. The heavier kinds are not profitable for distillation, containing a less percentage of volatile products; but when the specific gravity is as low as 32° or 30° they are considered unfit for the production of kerosene, but are used for lubricators, and it has lately been found that some of the oils of Western Virginia of 28°, corresponding with a specific gravity of 0·89, are the best lubricators. The heaviest oil I have tested was from Mecca, Ohio. It indicated 24° or 0·91 specific gravity. When oils are heavier than this it is due to earthy or mineral impurities in suspension.

The odor of the two last-named oils is the least offensive; in fact, when crude, not disagreeable. The most disagreeable and offensive are from Kentucky and Canada. Their odor is so strong as almost to exclude them from use. When the oils are distilled at a very low temperature, say below 100° Fahrenheit, and rectified, rhigolene comes off, indicating on Beaume's hydrometer 90° to 97° or about 0·6 specific gravity. When the temperature is raised to—

170°	we have	Gasoline	80° to 90°	0·63 to 0·61
280°	"	" Naphtha	70° to 80°	0·67 to 0·63
300°	"	" Benzine	60° to 70°	0·73 to 0·67
400°	"	" Kerosene	50° to 60°	0·78 to 0·72
500°	"	" Kerosene	40° to 50°	0·82 to 0·78
600°	"	" Kerosene heavy	40° to 50°	0·82 to 0·78
700°	"	" Solid paraffine and illuminating gas.		
800°	"	" Solid paraffine and illuminating gas.		

When the temperature of the still is above 500° the product is not as well fit for illuminating purposes—destructive distillation has set in, indicated by the large quantity of gas produced; and the distillate was formerly recommended as a lubricator; it possesses a very offensive odor and taste. At present most distillers use the lighter portions of it in the kerosene, and the heavier portions in the crude oil.

Petroleum has unjustly been condemned by some as a lubricator, because they had unfortunately only tried this last product of the destructive distillation, which being itself nothing but a condensed vapor, is volatile, will evaporate, leave the machinery dry—principally where exposed to heat—and is evidently entirely unfit for a lubricator.

It is the rule among distillers to run the still moderately slow at the end of the operation, which means to be careful not to raise the temperature too high, and by doing this the distillate is less heavy, and a great deal more may run in the kerosene and increase its percentage, which, when amounting to 70 per cent of the crude oil, is considered very fair.

There is another objection to those high temperatures—the destructive distillation is accompanied by the production of much paraffine, which being solid, and condensing in the coils, may stop them up, principally in winter, and has sometimes caused the explosion of the still.

Gasoline, naphtha, benzine are, as such, in the crude petroleum, the distillation only separates them from it; but as soon as we apply a higher temperature, say 400°, we decompose the petroleum and create new products, of which kerosene may be considered one. This may be verified by pouring the products of the distillation back in the remaining tar—an offensive mixture will be obtained very different from the original oil.

The tar drawn off after the distillation is accomplished, is usually mixed with melted rosin, and sold as a lubricator for coarse machinery, wagon grease, etc.

The heavy crude oils from Western Virginia and Kentucky, spoken of above, and which are very valuable lubricators, may be improved and adapted to delicate machinery by refining them by another process, of which filtration is the principal feature. Heat and acids destroy the lubricating qualities.

The difference between benzine and benzole is this: the benzine from petroleum varies during the distillation continually in specific gravity, it has no constant chemical composition, it is rather a mixture of different naphthas of different degrees of volatility and specific gravity. Benzole obtained from coal tar, on the contrary, is a well defined chemical combination of constant specific gravity, and sharply defined projection of its constituent elements. The benzine from petroleum contains, often, small quantities of true benzole, as is evident by the chemical reaction of nitric acid upon it, producing the characteristic bitter almond odor of nitro-benzole.

In closing, I will remark that at present the kerosene is the most profitable product of the distillation of petroleum, and that the benzine and naphtha are much less in price simply because there is more produced than needed in the market, notwithstanding those substances are most valuable chemical agents. There is no doubt, however, that as soon as some universal application is discovered for those substances, for instance a simple safe lamp to burn them in, they suddenly will rise in price and be esteemed highly by distillers, who at present are compelled to sell them for what they can get.

It has been found that retailers have bought the cheaper benzine and mixed it with the kerosene, and sold the mixture for pure kerosene. This explains the cause of the explosion of some petroleum lamps.

P. H. VANDER WEYDE, M.D.

Philadelphia, Pa. June 1, 1866.

The Manufacture of Taps for Cast and Wrought Iron.

MESSRS. EDITORS:—I have read with much interest the several articles on taps in your paper, and would like to make some comments on some of the ideas that have been presented, but do not wish to take up your space or time. I generally have two classes of taps; sometimes a third, when the work of the shop demands it. Each would be different in construction. First, taps for running through or always going one way, for nuts, etc. For tapping nuts I make a tap with a shank as long (according to size) as can be and resist torsion—from eight to fifteen inches. Whatever the size, I make four cuts or scores, a very little under on the cutting edge. I polish smooth after cutting the thread and never file back in the thread. On the thread I file back (in the longitudinal cuts) to the bottom, leaving from one-sixteenth to one-thirty-second on the full thread, bringing it to a sharp edge as I go down the taper to the end. The cuts should be large enough to hold the chips without clogging. With such a tap I have tapped twenty thousand half-inch nuts before it lost its size, running two hundred revolutions per minute. Second, taps for general work to be used with wrenches; I use the taper and plug as usual. All taps should have four cuts or scores, no more and no less. A three-sided tap is not easily measured. In all taps that require backing out, I make a semicircular or concave cut, making it a little deeper in the taper than the plug, as that has more chips than the plug. Filing back in the thread is ruinous to any tap that has to back out, as it gives the chip a chance to roll back, and, like a wedge, push off the tooth. The square tap to me is very objectionable, as it jams more than it cuts, and, especially in cast iron, is likely to start the thread from its base, and make a weak thread. I have seen one-half the thread come out with the tap where the square one is used. With such a tap as I have described, one plug is sufficient. I have had about eighteen years' experience with taps and I find that the above forms have served me the best.

The third class I speak of would be a separate set for wrought iron, where the work of the shop would demand it. I should give them the same general shape as those for cast iron, with this difference, I should give them a little deeper and sharper cut Wrought iron is not so apt to drag a tap as cast iron.

A. M. W.

Springfield, Mass.

[This subject is not yet exhausted. With some reservations we agree with our correspondent. His idea of making four scores or longitudinal cuts, is a correct one. As he says, the difficulty of measuring a tap having only three scores is a great one, a remark that applies equally to those containing five scores; and even in shops where the taps for different departments of the work run in sets and are sized, the necessity for measuring sometimes occurs. We hardly approve of polishing a tap after it is cut. We have the same objection to this that we have to filing and polishing journals after turning. The turning tool, properly managed, is the best finisher. Polishing with emery, which is but a crude manner of grinding, will more or less impair the sharpness of angles on which the tap, especially, depends for much of its efficiency. If the steel is properly annealed and the tool is kept in proper order while cutting the thread, the result will be much more satisfactory than the use of the polishing stick. The concave score for taps which run both ways, as those for tapping a hole only partially through the substance, is the best form. As little of the full thread should be left in this case as is consistent with strength. This must be determined by experiment. The practice of filing back these double-acting taps is, in our opinion, a ruinous one.—EDS.

Incompetent Engineers.

MESSRS. EDITORS:—As I am constantly observing, in my SCIENTIFIC AMERICAN, letters and editorials in regard to the theory and facts of boiler explosions, I would like to give you some information and opinions upon the subject of engineering as practiced in the Southern States.

Here, if any where, an engineer should be more competent than at the North; as he is, by the force of circumstances, dependent more upon his own resources, seldom having a large shop with a competent staff of managers to fall back upon, he must often lay out and superintend his own work and repairs. Machinery breaks down, or boilers burst, and people are injured or killed; if an investigation is had, a good and sufficient reason is given how and why the accident (?) occurred, and the matter drops. I believe the blame, in the majority of cases, lies with the engineers, because they are ignorant, or careless, or for the reason that, to keep their situations, they run defective boilers and machinery contrary to their own judgment, or good boilers, etc., with less men than necessary, thereby over-working themselves and being too much fagged out to bestow proper watchfulness and attention.

Employers are also criminal, inasmuch as they often prefer incompetent men because they work for less pay, or employ too few, so that they are overworked, or perhaps they affect "hot engineers." I know slow ships on this coast making two and a-half round voyages, and running three thousand miles per month, having only two engineers, who are expected not only to run the engines, but to keep them in order. It is, indeed, self-evident that they have very little rest, unless they trust to a fireman or greaser.

Inspectors are also greatly to blame for giving certificates to incompetent persons, without any examination. This I know that some do, merely on the recommendation of two competent engineers, who, in all cases that I know of, were interested. One case is of recent occurrence near here, in which certificates as above were given to two colored men, who went on a high-pressure boat for very low wages, and returned from the first trip with all three boilers burned out. The owners found they were "saving a penny and paying a pound;" but even if pecuniary matters had been satisfactory to them, had they, or the inspector any right to endanger the lives and property of others? I believe the true preventive for these accidents (?) is to come to the conclusion that engineers should be steady, sober, and attentive men, of good common sense and some education and experience, to employ only such, give them remunerative wages and not work them too hard. I also think that all engineers, (whether marine, stationary, or locomotive) should come under the same rule, and be required to pass an examination and hold a certificate.

I hope, if you coincide with me, you will ventilate these ideas, and thus by means of your valuable SCIENTIFIC, help to raise the science of engineering

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to its proper position, and thereby benefit the whole universal nation. MARINE ENGINEER.

Charleston, S. C.

[The ideas and suggestions of our correspondent are valuable. They apply not only to marine engineers but to the runners of stationary and locomotive engines. Too little attention has been paid to the proper qualifications of engineers, and, we may add, their services are too lightly valued. No person employed on a steamboat or ship, a train of cars, or in a manufactory, occupies a more responsible position than an engineer. On him depends, more than on any other person, the safety and protection of life and property. His incompetency may render null all regulations and preventives designed for safety. It is of the first importance that he should not only be practically acquainted with the machine which transmits the enormous power of steam, but that he should understand the nature of the element employed, and possess a good discriminating judgment and an aptness to provide for contingencies and to prevent and remedy accidents.

The rivalry between competing lines of travel, the desire to excel, operates against the proper education of engineers. Safety should be the first aim of an engineer, then the efficiency of his engine, then rapidity of operation. We hope to see the day when recklessness in engineers will be deemed criminal, and the agent and the principal, both, be held to strict legal accountability.—EDS.

NEW INVENTIONS.

The following are some of the most prominent of the patents issued the present week, with the names of the patentees :—

CHOPPING KNIFE.—JAMES SHEPARD, Bristol, Conn.—This invention consists in the employment of two circular cutters, mounted on a suitable shaft, to which is secured a shank or arm, provided with a handle for operating the cutters. The Patent was issued April 24, 1866.

DISEASES IN HORSES.—H. H LOCKWOOD, Madison, Wis. (Issued May 29, 1866.)—A very large amount of capital is invested in horse-flesh, in this country, and with the best of care and provision against accidents, it is a very precarious sort of property. The organism of the horse is almost as delicate as that of the *genus homo*, and demands corresponding attention. The art of the veterinary surgeon, therefore, is an important and valuable one, and any discovery tending to reduce the loss in equine property by disease, is so much added to the wealth of the country. To horsemen and farmers—to all who possess that valuable animal, the horse—a cure for spavins, ringbones, curbs and splints, which is reliable and safe, is a great desideratum. Our attention has been called to "Lockwood's Infallible Remedy," for this purpose, which is recommended to us on high authority, as effectual and certain—the cure generally being accomplished in twelve, or at most, twenty-four hours.

WEED KILLER.—GEO. P. ALLEN, Woolbury, Conn. (Issued April 25, 1866.)—This is a much-needed implement for onion culture, as well as for crops sown in drills, and effectually cleans walks of grass weeds, etc. The cutting blade is made zig-zag, and sharpened on both edges, like saw teeth. The attachment of this blade to the handle somewhat resembles a garden rake, with the blade fastened to the ends of the teeth. The end teeth serve as guides to show the operator how closely he may hoe to the crop without injuring it.

CLAMP.—P. F. HULBERT, Chatham, N. Y.—This invention relates to a clamp for molders' flasks, and consists in combining with the usual flask-clamp a cam-shaped lever, so that when the clamp is applied to the flask, by turning the said cam-lever in the proper direction, the flask will be firmly clamped and held together.

SHADE-CORD HOLDER.—G. W. NELL, Philadelphia, Pa.—This invention relates to a shade-cord holder, composed of a roller secured to a square rod, which slides up and down in a suitable case, and is provided with a screw shank, screwing into a tubular button, turning freely in the bottom of the case, being constantly depressed by the action of a spring, in such a manner that the cord, passing round the roller, is subjected to a certain tension by the spring, which can be increased and decreased by turning the tubular button, and by these means the tension of the cord can be so regulated that the shade is sustained in any position in which it may be brought.

SMOKING PIPE.—RENE MASSON, Tremont, N. Y.—This invention relates to a smoking pipe, in which a globe or vial of glass, or other suitable material, is secured to the stem between the bowl and the mouth-piece, in combination with a tube extending from the stem down into the globe, and with a partition above the tube, so that when the globe is filled with water the smoke is compelled to pass down through it before it reaches the mouth-piece, and a pipe is obtained which combines the advantages of the Persian narguillet in a small compass.

FENCE.—ALONZO W. OLDS, Green Oaks, Mich.—This invention consists of a fence, each of the braces or stakes of which are secured to both the uprights and the standards that hold the overlapping ends of the rails in place, which has a wire, connecting the uprights and the top rails of the fence, and which has a short stake, connected with the long stake, and with the bottom of the fence.

CARRIAGE SPRINGS.—G. S MANNING, Springfield, Ill.—This invention consists of the S-shaped spring, either with or without strengthening leaf or leaves, connected to the axle and to the supporting arms of the carriage body.

CHURN.—S. T. W. POTTER, Scott, N. Y.—This invention consists in a novel construction of the dasher employed for agitating the cream in a churn for producing butter.

MACHINE FOR CUTTING OFF BOLTS, ETC.—D. D. ROBINSON, Niles, Michigan.—This invention consists in a cutting machine formed by combining and arranging the eccentric levers, jaws, and plates with each other, for the purpose of causing the jaws to move equally in operating.

DETACHING BOATS FROM THEIR DAVITS.—THOMAS HUNTINGTON, New Rochelle, N. Y.—This is an improved means for detaching ships' boats from their davits by the simultaneous detachment of the hooks of both the front and rear tackle blocks from the boat, so that the latter may be set free upon the water without the liability of being swamped or capsized in a swell or sea.

CLOTHES-WASHING MACHINE.—JAMES HERVEY JENKINS, Yorkville, N. Y.—The object of this invention is to obtain a clothes-washing machine which will be adapted for operating upon all kinds or qualities of clothes, and thoroughly cleanse the same, without injuring them in the least.

COMBINED DRILL AND FERTILIZER.—GEO. E. COOPER, Baltimore, Md.—This is a novel arrangement of devices for dropping seed and fertilizing substances—and also stopping the dropping when the tubes are raised out of the ground.

SWAGE FOR SHARPENING SAW TEETH.—J. E. EMERSON, Trenton N. J.—The shank has a groove made in it transversely through the end intended to operate upon the tooth, in which a pin is inserted with several notches corresponding to the width and shape of the tooth required. The dies operate upon the underside and two edges of the tooth; the upper side of the tooth is operated upon by the projecting jaw of the stock.

FORGING, SHEARING, AND PUNCHING DEVICE.—J. E. EMERSON, Trenton, N. J.—The improvement in this case consists in the arrangement together, in one tool, of an anvil, punch and shearing device.

STEAM BOILER.—J. A. CAMPBELL, St. Louis, Mo.—This is an improvement in steam generators, and consists in the combination of devices, consisting of a coil of pipes placed in the furnace, and leading from thence to the reserve water chamber, placed above the generator. Over the latter is placed another water chamber communicating with the other by means of a pipe provided with a valve controlled by a float in the lower chamber, this float and valve control the amount of water admitted to the reserve water chamber. This second chamber is also connected with the coils of pipe in the furnace, so that the pressure of steam is the same in it as in the reserve water chamber, and is also connected with still another water chamber placed above it by pipes which the feed water passes.

SNAP HOOK.—WM. BELLAIRS AND OLIVER D. BARTO, Atkinson, Ill.—This invention consists of a double hook, the inner part of which slides in a channel in the outer part, and which is so formed that, when in use, it closes and locks the opening in the outer part through which the ring is inserted, being held forward in such a position by a spring.

CARTRIDGES.—ANOS S. BLAKE, Waterbury, Conn.—This invention consists in so making cartridges for breech-loading fire-arms as that the part which contains the powder and ball is separate and detached from that which contains the fulminate.

HORSESHOES.—HARRISON ARMSTRONG, Sparta, Wis.—This invention consists in an improved method of making the calks for horse-shoes and of welding them on to the shoes. The calks are prepared in blank by rolling out a bar of steel into proper form, with one edge sharp.

HOE.—EDWIN PITSCH AND WILLIAM W. BRIGGS, Mattaville, N. Y.—This invention relates to hoes which are provided with teeth of triangular form, and it consists in constructing the hoe in a novel manner whereby several advantages are obtained.

FLOORING JACK.—AARON LOYD, Mattoon, Ill.—This invention is designed for placing flooring together, as the boards are being laid; it consists in the employment of a lever having a bifurcated head, each fork carrying a serrated cam for clasping the joist, the lever being provided with a tongue for crowding up the boards, and a prop for holding the device rigidly while the boards are being nailed.

WATER COOLER AND FILTER COMBINED.—H. T WOODMAN, Dubuque, Iowa.—This invention consists in the combination of a filtering device with a water cooler so that the water used may be filtered before it is allowed to pass into the drawing-off chamber of the apparatus.

ARTIFICIAL FUEL.—CHARLES SAFFRAY, M. D., New York City.—This is a process for aggregating coal dust or waste coal by mixing the same cold with pitch or rosin reduced to a fine powder, so that when the mass is compressed and slightly heated, the pitch or rosin fuses and forms a cement which firmly unites the particles of coal, and a fuel is obtained which can be used with great advantage in locomotive or other steam boiler furnaces or in any furnace where a steady and powerful heat is desired.

SHEEP RACK.—D. F. SEXTON, Whiting, Vt.—This invention consists in arranging the troughs of a sheep rack within a suitable frame so that they can be run up or down in the framework, and thus be raised when it is desired to fill them with feed, and afterward run down, the sheep being, the meanwhile, prevented from annoying the operator. Also in so placing strips for dividing off the spaces of access to the troughs for each sheep that the opening through which the animal's head may be thrust shall be greater at the top than at the bottom, whereby the sheep are not so likely to waste the feed.

MEDICAL COMPOUND.—GUSTAVUS BODE, Milwaukee, Wis.—Certain ingredients, which will constitute an electric magnetic agent, are mixed together and applied in a belt, pad, or the like, for the cure of rheumatism, neuralgia, and other nervous diseases.

MACHINE FOR PICKING COTTON.—JOHN GRIFFIN, Louisville, Ky.—The inventor of this machine for picking cotton has already secured several patents for the same object. In this one he secures more power in the picking apparatus; the device is more readily manipulated, so that the work will be less, and prevents the choking or clogging of the cotton in the tube.

CHURN DASHER.—A. KIRLIN, Rock Island, Ill.—This invention consists in forming the staff of the dasher of a churn hollow, and so arranging an air pump therein that, as the dasher is moved up and down, air shall be drawn through the dasher staff and forced into the bottom of the churn, passing and circulating through the cream.

SHIPS' PUMP.—LEBBEUS SIMKINS, Brooklyn, N. Y.—This invention relates to a ship's pump which connects by suitable gear wheels and shafts with the capstan, so that motion can be imparted to the plunger of the pump by turning the capstan, and the operation of the pump is materially facilitated.

SHOVEL AND TONGS.—R. D. BRADLEY, Preston, Md.—This invention consists in so forming a pair of tongs, that a shovel being attached to one leg, the instrument can be used for both shovel and tongs. Ordinary tongs can be thus furnished.

DREDGE ROLLER FOR OYSTER BOATS.—C T. BELBIN, Baltimore Md.—This consists of a flange attached to the roller so as to catch and carry the spurs or teeth of the oyster rake and to enable the dredge to be readily handed over the side or gunwale of the boat.

TIRE BENDING MACHINE.—D. BALLOU Havanna, N. Y.—This is a wheel revolving by means of a lever suitably connected and winding upon its periphery—the iron bar intended for the tire—the iron being firmly pressed against the wheel by the friction roller, which revolves on an elastic bearing below.

Notes and Queries

A. C. T., of Mass.—Your own observation, if you will notice the movements of a vessel driven by a propeller, would show you the fallacy of your implied supposition. The propeller is generally placed about or near the center of gravity, and could not exert a perceptible influence on the movements of the vessel from side to side. Your perpetual-motion idea is unworthy your attention. Look at your diagram and you must see that your weights, in whatever position, whether sixes or nines, just balance each other.

C. B. J., of Mass., sends us an article explaining his idea of a speaking machine. It is ingenious and perhaps possible of attainment. When the machine should be completed, however, and in successful operation, its value would be that merely of a curiosity. The subject of the article is not of sufficient general interest and value for publication.

H. K. B., of Va., desires to find a proventive to the ravages of worms (the teredo probably) on wood immersed in salt water. He says the palmetto is proof against their attacks. Possibly some of our correspondents can give the desired information. We had supposed that nothing but sheathing with metal would preserve timber in salt water from the worm. If there is a preparation efficient as a defense against these destroyers, it is a valuable discovery.

E. L. M.—Of ——.—Any new and useful substance used in a boiler for the prevention of incrustation is patentable. Nitro-glycerin is made by pouring drop by drop, or in minute quantities, one equivalent of glycerin into nine of sulphuric and three of nitric acid, stirring the mixture during the operation.

O. B. D., of Vt.—When linseed oil is boiled a longer time than for ordinary varnish, it becomes thicker and more adhesive. We suppose such an article is what you want.

E. Q., of N. Y., says that in some small steam engines the piston is solid with annular grooves on its periphery, the piston being packed by condensed steam. He asks if the same principle cannot be applied to the packing of the rod. In reply we would say that engines, large as well as small, have been and are now built in this city with a solid piston and glands without packing, and are running successfully. The annular groove is no benefit, but a detriment.

J. E. B., of Mass., who asked a very ancient question and to whom, being a Yankee, we replied by asking another, May 26, sends us a complete and sensible answer to his own query. Also J. E. B., of Conn., writes correctly on the same subject. Neither of the gentlemen, however, answer our question.

A. C. R., of Ohio.—Others beside yourself have failed to make good meerschaum from carbonate of magnesia and soluble glass. But it is certain that meerschaum is a silicate of magnesia, and that a fair article can be made artificially. We would not encourage any one to trouble himself much with the subject unless he has plenty of leisure and acquaintance with chemical principles.

J. P., of N. J.—A solution of cyanide of potassium will probably be found useful in restoring old galvanized iron to something like its original brightness. As a general rule, however, mechanical are better than chemical means for brightening metals.

K., of Mass.—The carbon elements of Bunsen's battery are commonly made of what is known as gas carbon, *i. e.*, the carbon deposited from gas in the gas retorts. This carbon is ground fine, made plastic with gum water, molded into shape, and then baked.

E. H., of N. Y.—The anastatic process is what you want for transferring old engravings to a lithographic stone. It consists, in brief, in softening the ink by an alkali, and then by great pressure in contact with the stone, a new printing surface is obtained.

SPECIAL NOTICES.

Horace T. Robbins, of Boston, Mass., has petitioned for the extension of a patent granted to him on the 14th day of September, 1852, for an improvement in Shuttle-guides to Looms. The petition will be heard on the 27th of August next.

Robert Knight, of Cleveland, Ohio, has petitioned for the extension of a patent granted to him on the 21st day of September, 1852, for an improvement in Machinery for Beveling the Edges of Skelps or Metallic Strips, etc. The petition will be heard on the 31 of September next.

Edward A. Palmer and Adolphus J. Simmons, of Clayville, N. Y., have petitioned for the extension of a patent granted to them on the 7th day of September, 1852, for an improvement in Whiffletree Hooks. The petition will be heard on the 20th day of August next.

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Improved Patent Annular Oven.

By the usual methods of burning pottery, bricks, and lime, it is well known that there is a large amount of waste heat, and consequently a waste of fuel. Since the earliest ages, the process and the means employed to render durable the products of the ceramic art have been of the simplest nature—only the application of heat in a common kiln or oven. Although improvements have been made from time to time, the great desideratum of a continuously acting kiln has not heretofore been attained. Much time, fuel, and heat has been wasted in the delay of removing one charge and introducing another. The oven under consideration is intended to supply that want.

The annular or ring oven is used to burn common brick, drain-tiles, fire-brick, lime, all kinds of pottery-ware, to roast ores, to burn minerals, etc., and works without interruption.

The principles on which the operation of this burning apparatus is based, are very simple, though so entirely different from all kinds of existing kilns and furnaces, that an especial explanation is required. Fig. 1 is a vertical section, Fig. 2 is a plan, half of it in horizontal section. The annular form is adopted for these kilns because it affords the greatest solidity, but this can be varied to admit of local circumstances. The kiln consists of a circular channel, *a a*, which receives the objects to be fired, introduced through doors, *b b*, in the outside wall. Flues, *c c c*, lead from the hearth of the kiln to the smoke chamber, *e e e*, which surrounds the base of the chimney, *d*. The communication of each flue can be cut off at will, by means of a cast-iron, bell-shaped damper, *f f*, Fig. 2. An intercepting slide can be lowered in grooves, *g g*, built into the walls of the kiln, immediately after each flue, so as to separate it at any distinct or equi-distant compartment. The fuel passes through apertures, *h h*, which are constructed in the arch, and falls through channels formed by the objects to be burned to a chamber in the hearth of the kiln, from which a certain number of small flues radiate to produce a free current from fire to fire.

In describing the manipulation of this kiln, we take as example the kiln erected in Carbon Cliff, Rock Island, Ill. This kiln, which is in full operation, has 12 compartments to which there are 12 entries or doorways, *b b*, also the same number of flues, *c c c*, communicating with the smoke chamber, *e e*, and just as many openings, *g g*, in the arch for the reception of the large intercepting damper slide; thus the kiln can be divided at any one of the 12 parts. For a better distinction, these compartments may be numbered from 1 to 12, of which two, No. 12 and 1, we will suppose, are separated by the intercepting slide. The objects to be burned may be brick or tiles, etc., and the fire in full operation; the doors leading to the compartments, 1 and 2, being open—No. 1 for filling it with fresh goods, and No. 2 for taking out those burnt and already cooled. The compartments 3, 4, 5, and 6, which are filled with burned goods, are gradually cooled by the air entering through the doors of No. 1 and 2, and as it passes on through warmer, at last glowing ware, it will result that the kiln fires are supplied with atmospheric air almost as hot as the kiln itself. In compartment No. 7, the fire is burning and when its contents have reached the desired temperature, No. 8 will have arrived at such a degree from the absorption of the waste heat, that the fuel introduced from the top of No. 8 is instantly inflamed. The compartments 9, 10, 11, and 12, will be dried off and heated one after another by the waste heat, which passes through and expands itself on the contents of these compartments, and on its arrival in No. 12, meeting with the obstruction of the slide, it is conducted by the small flue, *c*, to the chimney, with its temperature so lowered that it will only just support the draft. No. 1 being now filled, the slide between 12 and 1 is taken out and lowered again between 1 and 2. The damper of the flue to No. 12 is now closed and that of No. 1 lifted; the door of No. 1 is closed and that of compartment 3 opened, the contents of which will be sufficiently cooled to be taken out, while No. 2, which is emptied, can be filled again. The fire now being advanced to No. 8.

In this manner it is possible to burn bricks, lime, tiles or pottery ware, etc., without any interruption, filling and emptying the kiln at the same time; and it will be understood that in this kiln, at the same time, ware is burnt, gradually cooled and heated, and ware put in and taken out.

Practical men know very well what a great loss of heat occurs in the ordinary mode of burning bricks, lime, etc.; this great loss arises in a two-fold way. First, during the burning of objects like bricks, lime, etc., the air which has passed through the fuel, or among the heated bricks, etc., and the smoke, including gaseous products generally, pass away from the kiln to waste, at a very high temperature, even at a red heat, during a considerable part of the process. Second, when the bricks, etc., are raised to the high temperature required to burn them and render them permanently hard, the great store of heat which they contain is entirely thrown to waste, while they are left to cool. Both mentioned losses of heat are avoided in the kiln we here introduce. The advantages of this oven may be summed up as follows:—The heat of the cooling articles is not wasted but supplies caloric to the atmospheric air necessary to combustion, thus economizing fuel; thus all the heat is utilized, and at least sixty per cent of the fuel used in ordinary kilns is saved. The state of the fire and the condition of the work can be ascertained at any and all times. Charging and discharging can be done at the same time without interrupting the continuity of the work. Convenience of access to the ovens, and facility for repairs while in operation. The use of the cheapest fuels, as combustion is carried on at a very high temperature. Total absence of smoke, owing to perfect combustion of the gases, and freedom from injury to the goods by sudden changes of temperature.

Fig. 1

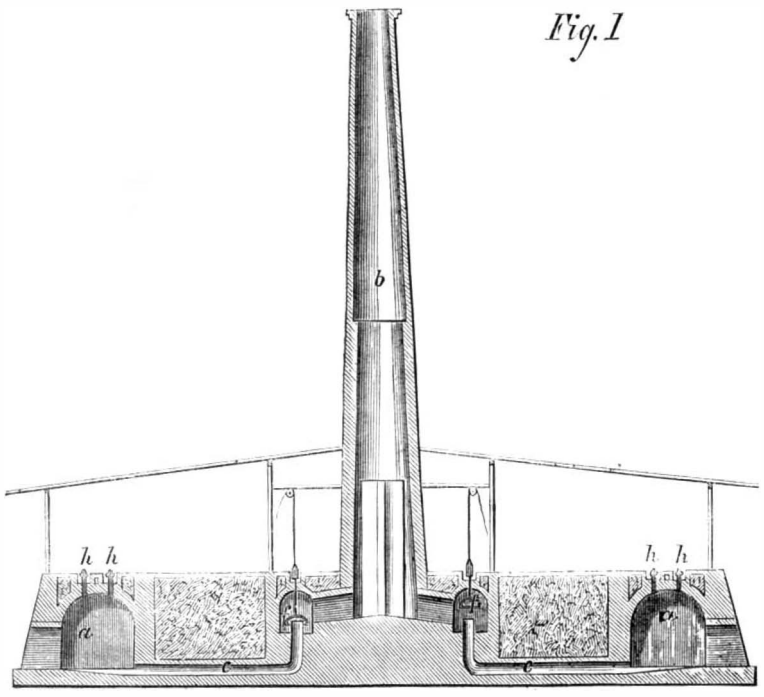
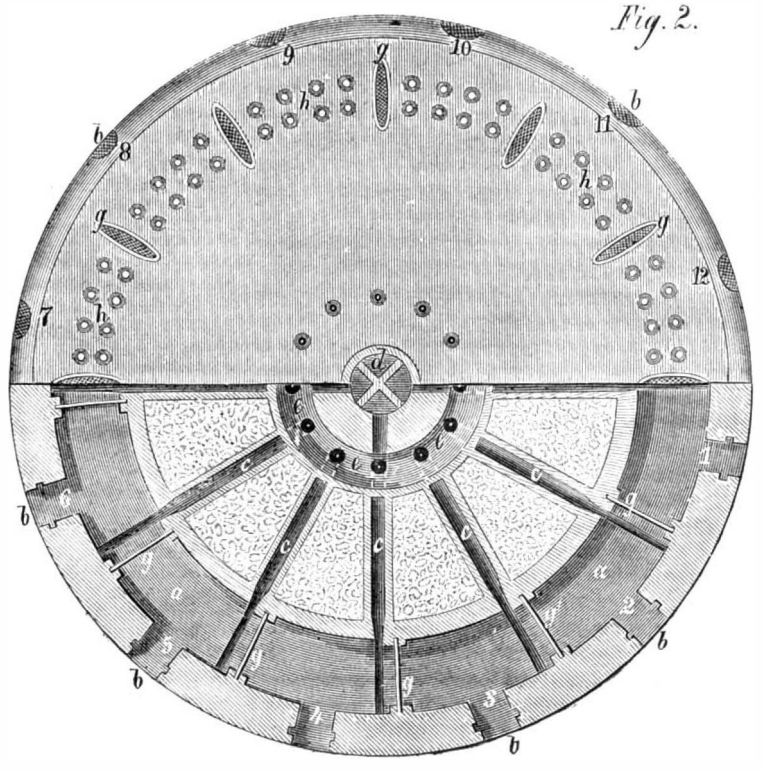


Fig. 2.



HOFFMAN'S ANNULAR OVEN.

It is equally well adapted to roasting ores, burning lime, cement, and bricks, tiles, etc. More than two hundred of them are in use in Europe. One can be seen in operation at the Argillo Works, Carbon Cliff, Rock Island, Ill., and all information can be obtained of G. L. Dethless, 319 Third street, New York City, or of C. E. Glacius, 322 W. Madison street, Chicago, Ill. Patented through the Scientific American Patent Agency, June 13 1865.

NEW PUBLICATIONS.

"SUMMER REST."—Ticknor & Fields, Boston.

GAIL HAMILTON has in the press of her publishers a new volume specially adapted to summer reading, and bearing the taking title of "Summer Rest." Most of the articles in this volume are now for the first time printed, and will be found equal to any of the author's most brilliant essays. "Hallcarnassus" appears again on the carpet; and his exploits in the way of gardening and other domestic matters are made very amusing. Gail Hamilton is never dull. Possessed of a sharp and ready wit, speaking boldly, and that too upon topics wherein women have been supposed to have but little interest, she has already gathered about her an audience, which, by its hearty appreciation of her writings, attests the truth of many of her convictions. The success of her various volumes of essays has been without a parallel; in fact, she is the most successful writer of the day

GRAPES AND WINE.—Published by G. E. & F W. Woodward, No. 37 Park Row, New York.

This volume was written by George Husman, of Missouri, a practical wine maker. He treats upon the propagation of the vine and the choice of varieties best adapted to produce wine. He also devotes a chapter to the methods of manufacture, which gives a clear idea of the processes necessary. The book is well illustrated, and is a valuable work.

AMERICAN ANNUAL CYCLOPEDIA FOR 1865.

Upon completion of the "American Encyclopedia," Messrs. Appleton & Co., of this city, began the publication of the "American Annual Cyclopedia." Vol 5, for 1865, is now being issued. It embraces the final military operations of the late war, the change in the Administration of the Government, debates in Congress in relation to the Southern States, Report of Gen. Grant, measures taken by the Government in regard to Freedmen and Emancipation, details of internal affairs of the country, and resumption of Commercial relations with the South, relations with foreign nations, with articles upon Cholera, Cattle Disease, Astronomy, Chemistry, Geographical Explorations, Biographies of eminent men, and a great variety of other topics. This volume contains 850 pages with portraits of Lincoln, Johnson, and Farragut, and is exceedingly valuable as a work of reference and instruction.

IT has lately been discovered by a German chemist that a most beautiful scarlet or purple dye may be produced from theine. This substance occurs in the leaves of a species of horse chesnut and holly, which grow in Brazil, as well as in tea.

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VOL. XIV., No. 25..[NEW SERIES.]. *Twenty-first Year.*

NEW YORK, SATURDAY, JUNE 16, 1866.

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END OF VOLUME XIV.

With our next number will close Vol. XIV. of the New Series, at which time a large number of subscriptions will expire. We hope our subscribers will all promptly renew, and we would repeat what we have before said, that a Club of ten persons can have the paper at $2 50 each.

The SCIENTIFIC AMERICAN for the past six months has abounded in valuable information. To say nothing of our own editorial labors, we think the valuable contributions of our correspondents have amply repaid all our readers. The past is an index of the future character of our journal.

SYSTEM A MEANS OF ECONOMY.

Those who have been connected with the business of large manufacturing establishments, or have assisted in the management of corporations where employes were numbered by hundreds and their expenses have counted by hundreds of thousands yearly, readily recognize and value the observation of a rigid and minute system of attention to detail and care for the "little things." A carelessness in one single matter, affecting the use and waste of the most insignificant article employed by these concerns, would seriously affect the annual balance sheet.

What is important to these cannot be unimportant to the smaller fry, whose limited profits are made by a close calculation of the coppers. The small mechanic who employs from three to thirty hands is seriously interested in the matter of saving in little things. It is painful sometimes to visit a small shop and note the waste and extravagance, the want of careful foresight and judicious economy, which is robbing the proprietor, year by year, of that which his labor and enterprise has fairly earned. A machinist will have in use oilers which pass a stream sufficient to lubricate the journals of a marine engine; or he will, for the want of adjusting a pulley or lining a shaft, cut and wear a belt worth ten or twenty dollars, or destroy a set of boxes. The scrap iron is swept up and thrown upon the dust heap; long bolts fitted with nuts are cut in two, instead of forging one for the purpose required. The grindstone is gouged and scored for want of a little care, necessitating its razing once a week or once a month when it should have been kept in order for six months. We might go on and enumerate many more of these senseless and careless leaks, which, in the aggregate, make a fearful raid on the proprietor's pocket, but we will mention only one other, not so apparent, though hardly less serious.

Want of order loses shop owners a great many dollars annually. The old saw "a place for every thing and every thing in its place" is not improved by having "a good many places for every thing." Some workmen have the bad habit of leaving a tool where they last used it, and a lazy habit of forgetting all about it. Such men will cost half their wages to their employers. A job which, if the implement required was at hand, would occupy only thirty minutes, requires an hour, counting the time spent in looking for the tool and that spent in putting it into shape for use; for it often happens that tools thus left everywhere are not taken care of in other respects. In every well-ordered shop, in every one which is run for profit, there should be an unvarying rule that every tool or implement should be returned to its place as soon as done with. If it is one in frequent or general use, the last user should be compelled to see that it be left in good shape for the next man. As the military books say "this rule is general," and no exception should be made to it. Racks for drills, shelves for taps, drawers for files and chisels, location for hammers, are found in every shop; but often the drills are stubs without points, the taps are broken or clogged with "gurry," the files are worn out or broken, the chisels cracked, etc. But it these matters are tolerably well attended to, others may be neglected. There should be a box to receive all old bolts, screws and nuts; they are "handy to have in the shop." Another for cast-iron scraps, another for pieces of wrought iron, saving the forger often from cutting a bar; another for old brass and copper, and one for steel scraps.

These little things are well worthy the attention of the foreman and the employer. No good workman will object to stringent rules in this respect. He knows it is of immediate advantage to him in saving annoyance and profanity, and is of future advantage by giving him a habit of order affecting his whole life. No employer who has introduced and honestly tested this system of economy and order could be induced to lapse into old habits of easy-going heedlessness.

ADOPTION OF THE METRIC SYSTEM.

In the year 1860, we threw out the suggestion that some member of Congress might render a great service by introducing a bill for the adoption in this country of the French system of weights and measures, and after six years of urging, we have now the satisfaction of seeing the step taken, Hon. Mr. Kasson, of Iowa, having secured the honor of its authorship. In this result we recognize a new proof of the wide influence of the SCIENTIFIC AMERICAN; though we are not so ignorant of the history of the movement as to claim for ourselves the exclusive credit. Nearly all learned societies in this country and Europe have advocated the adoption of the metrical system; it has worked its way into nearly all scientific periodicals and books; the movement is, in fact, urged forward by the combined intelligence of the civilized world. Great Britain has recently passed a law similar to ours, and it is understood that in both countries these permissive laws are preliminary to enactments requiring the use of the system. It has already come into use in the principal countries of Europe, and will doubtless soon be the only system of weights and measures in commercial and Christian countries.

The advantages of the system over the present complicated and incongruous tables of weights and measures, are even greater than the advantages of our decimal currency over the old English system of pounds, shillings, and pence. When once adopted we shall all wonder that we went without it so long.

The difficulties in the way of its adoption are two—the necessity of learning it by the people, and the sacrifice of value in the measures and scales now on hand. Both of these difficulties are far less than would first appear.

The system can be fully mastered and learned by any one in thirty minutes. First, it is necessary to learn the meaning of the four units—

Meter, the unit of length.
Liter, the unit of capacity.
Gram, the unit of weight.
Are, the unit of area.

Then it is necessary to learn the meaning of four Greek numerals and three Latin. The Greek are—

Deka.....10.
Hecto.....100.
Kilo.....1,000.
Myria.....10,000.

The Latin prefixes are—

Deci.....1-10th.
Centi.....1-100th.
Milli.....1-1000th.

The system is decimal. There is a measure ten times the length of the meter, and this is called the dekameter, there is another 100 times the length, and this is called the hectometer. The same way with the weights; there is a weight ten times as heavy as the gram, and this is called a dekagram; there is another 100 times as heavy, and this is called a hectogram. The same prefixes are applied to all the units—the Greek for the multiplies, and the Latin for the fractions. When the meaning of eleven words are learned, the system is completely mastered.

The sacrifice of value in the measures and scales at present in use will be far less than would be at first supposed. All platform balances will be perfectly adapted to the new system with the exception of the beam and the pea. Manufacturers of scales—Fairbanks and others—would doubtless make new beams and peas, and offer them at fair rates to the present owners of scales, who could readily apply them. Ordinary balances would merely require a new set of weights. A peck measure could have a little strip taken off the top, reducing its depth about one ninth, when it would become the measure of a dekaliter. Box-wood rules, steelyards, and some other measures, would become worthless, but the sacrifice of property in this way would be so gently distributed over the community, that it would be scarcely felt. The table printed in our last number may be found valuable for future reference.

Medicated Pads.

Among the patents recently granted is that to Dr. Hulse, of this city, for a compound for medical pads, to be worn upon the person, as a preventive against cholera and miasmatic diseases. The pad is a neat little article composed of cloth, provided with pockets or compartments containing odoriferous ingredients, well known for their utility in the above classes of diseases. We are so well satisfied with the valuable qualities of this simple improvement that we have introduced it in our establishment, every person in our employ being supplied therewith. The improvement is to be had at the leading drug stores.

BRIGHT ANNEALED WIRE.—A correspondent, referring to an article heretofore published in this paper on annealing wire, says, that large wire as well as small, can be annealed and still retain the brightness it possessed, after passing through the drawing dies. The process is to pack the coils in cylindrical cast-iron pots with double lids, the outer one resting on a projection or rim half an inch below the top of the pot, leaving room between the outside of the inner lid and the inside of the outer, for dry sand to exclude the atmosphere. The pots should not be opened until quite cool after the heating process, otherwise the atmosphere will so far oxidize the surface as to turn the color to a blue or black.

WHAT IS SALERATUS?—Wood is burnt to ashes, these are lixivated, and lye is the result. Lye is evaporated by boiling, black salt is the residuum. The salt undergoes purification by fire, and the potash of commerce is obtained. By another process we change potash into pearlash. Now put these in sacks and place them over a distillery mash tub, where the fermentation evolves carbonic acid gas, and the pearlash absorbs it and is rendered solid; the product being heavier, whiter, and drier than the pearlash. It is now saleratus. How much such salts of lye and carbonic acid gas one can bear and remain healthy, is a question for a saleratus eater.

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ISSUED FROM THE U. S. PATENT OFFICE

FOR THE WEEK ENDING JUNE 5, 1866.

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☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

55,219.—SNAP-HOOK.—Elijah A. Andrews, New Britain, Conn.:

I claim the combination of the latch, e, within and flush with the back of the recess, d, relative to the opening, g, with the pad, i, spring, n, and loop, c, substantially as and for the purpose described.

55,220.—HORSE-SHOE.—Harrison Armstrong, Sparta, Wis.:

I claim forming a spur on the calk by driving a portion of the ledge downwards, substantially as and for the purpose described.

55,221.—LOW-WATER DETECTOR.—John Ashcroft, Brooklyn, N. Y.:

I claim, 1st, The combination of the pipe, G, connected to the boiler below the proper water-line, the discharge passage, H, and the fusible disk, C, with the screw-valve, D, arranged substantially as and for the purpose herein set forth.

2d, The bearing-piece, F, in combination with the fusible disk, C, and the connections, G and H, arranged as specified so that the communicati on between the boiler and the said fusible part cannot be closed until after the fusible part has yielded to the temperature, as herei specified.

55,222.—TUYERE.—Abel T. Atherton, Lowell, Mass.:

I claim the combination of the cistern, b, tuyere iron, f, pipe, c, and packing, e, constructed and arranged substantially as set forth.

55,223.—DOVETAILING MACHINE.—Juan S. L. Babbs, New Albany, Ind.:

I claim in combination with the conical cutters and the carriage by which the stock is presented to the action of the cutters of a secondary carriage or stock-holder, arranged to operate substantially as set forth.

55,224.—TIRE-BENDING MACHINE.—D. Ballou, Havanna, N. Y.:

I claim the combination of the wheel, D, with its holder, N, or its equivalent, the ratchet, G, H, lever, F, and spring-pressure roller, J, K, L, substantially as described and represented.

55,225.—COOKING STOVE.—A. C. Barstow, Providence, R. I.:

I claim, 1st, The construction of stoves of otherwise ordinary or suitable arrangement ~~for admission of intermingling~~ collars or closing caps for the flue and boiler holes, substantially in the manner herein described, dispensing with the use of rivets or other means of permanent attachment.

2d, The combination with a stove of otherwise ordinary or suitable construction of a hot closet arranged underneath the body of the stove, substantially as shown and set forth.

3d, In a stove provided with a hot closet underneath the body thereof, I claim in lieu of the usual legs forming a base around the stove to inclose the said closet, in the manner and for the purpose set forth.

4th, The employment in combination with a stove of otherwise ordinary or suitable construction of a movable fire-pot or pan having a closed bottom and holes at the sides, substantially as and for the purposes set forth.

55,226.—BREAKING AND TRAINING BRIDLE.—William O. Bartlett, New York City:

I claim an improvement in bridles by attaching a cord or strap to the same, so constructed that by pulling on the reins a pressure is produced downwards on the sensitive part of the animal's neck, and upward in his mouth, substantially as herein described.

55,227.—CRADLE.—William Bedle, Keyport, N. J.:

I claim the weighted arm, G, the brake, I, and clock mechanism, D, E, F, or their equivalents, when in combination with the cradle, A, substantially as and for the purposes described and set forth.

55,228.—DREDGE ROLLER FOR OYSTER-BOATS.—Chas. T. Belbin, Baltimore, Md.:

I claim the arrangement on the roller, d, of the ledge or flange, c, and the handle, e, as and for the purpose described.

55,229.—SNAP-HOOK.—William Bellairs and Oliver D. Barto, Atkinson, Ill.:

We claim the combination of the outer hook and the inner hook with its arms, H, projection, D, and dovetail-slide, F, spring, E, and shank, B, arranged and operating in the manner and for the purpose herein specified.

55,230.—METHOD OF TURNING BRIDGES.—William N. Berkeley, Cedar Rapids, Iowa:

I claim, 1st, In combination with a revolving pedestal, B, the employment of the stationary sheave, D, and track, E, with the friction-roller, H, and chain, or its equivalent, a, arranged and operating substantially as herein specified and shown.

2d, The combination of the revolving pedestal, B, sheave, D, track, E, roller, H, pulley, I, and chain, a, arranged and operating substantially as shown and described.

3d, The employment of the adjustable pulley, I, when arranged with the roller, H, and chain, a, as and for the purposes set forth.

55,231.—METHOD OF TURNING BRIDGES.—William N. Berkeley, Cedar Rapids, Iowa:

I claim, 1st In combination with the revolving pedestal, B, the employment of the circular stationary bearing, D, the shafts, F G, and friction-wheels, H, I, arranged and operating substantially as and for the purposes specified.

2d, In combination with the above, I claim the arrangement of the levers, M, N, and connecting-bar, O, as and for the purposes set forth.

55,232.—MACHINE FOR SCUTCHING FLAX.—Henry Black, Lewisburg, Ohio:

I claim the use of a reel with swords attached, which operate transversely upon the flax-apron, a movable scutching-board; the reel, with the swords and the movable scutching-board, all being my own invention, they are for all which I claim a patent.

55,233.—METALLIC CARTRIDGE.—Amos S. Blake, Waterbury, Conn.:

I claim, as an improvement in cartridge-cases, the perforated cap, B, with its oblong opening, F, arranged to operate with the case, A, so that by the expansion of the metal in explosion of the powder a portion of the case, A, will be forced into the opening in the cap, B, and the two parts be held together substantially as described.

55,234.—MEDICAL COMPOUND.—Gustavus Bode, Milwaukee, Wis.:

I claim a medical compound, of the ingredients herein specified, and in about the proportions named, intended as a remedy for rheumatism, neuralgia, and other nervous diseases.

55,235.—COFFER-DAM.—James Braidwood, Wilmington, Ill.:

I claim, 1st, The making them of sections that may be fitted within each and operated and detached from each other, substantially as herein recited.

2d, The elastic valve surrounding the points of union of the sections, and made tight by the outward pressure, as described.

3d, The detachable mechanical means or devices for forcing down the sections by pressure upon the surface, as set forth.

55,236.—SAIL.—Hiram Brown, Cape Elizabeth, Maine:

I claim, 1st, In conjunction with the supplementary reefing-yard, the use of the band, D, to attach the sail to the center-yard, as described for the purposes set forth.

2d, The combination of the spilling lines, arranged as specified, with the eyelets, i, i, with the supplementary reefing-yard, as described.

55,237.—STEAM GENERATOR.—James A. Campbell, St. Louis, Mo.:

I claim, 1st, The combination of the reserve water-chamber, E, the pipe, M, N, the stopper, J, the regulating-nuts, L, L, L, L, and the float, I.

2d, I claim the combination of the furnace, K, the coil of pipe, A, B, C, the float, I, the regulating nuts, L, L, L, L, the reserve water-chamber, E, and the pipes, M and N.

3d, The combination of the coil of pipe, F, G, H, with the reserve water chamber, E.

4th, In combination with the reserve water chamber, E, and steam chamber, D, I claim the chamber, O, the pipes, R, S, T, U, and the cocks, P, Q, V, W.

55,238.—MACHINE FOR JOINTING STAVES.—Aaron Casebeer, Pipesville, Pa:

I claim a stave-holder with the arc gauges, marked A, A, with screws, B, B, B, by means of which a beveled joint for any circumference may be made.

55,239.—YARN-DELIVERY APPARATUS FOR BRAIDING MACHINES.—G. F. Chambers and S. Robinson, Worcester, Mass.:

We claim, 1st, The combination with standard, C, of a friction lever, G, substantially as and for the purposes set forth.

2d, The combination with standard, C, and sliding-weight, P, of a friction lever having a projection, h, as and for the purposes set forth.

3d, The combination with friction lever, G, of slide or stop and tension weight, D, and spr g, j, substantially as set forth.

55,240.—SEPARATING HYDRO-CARBONS.—Robert A. Chesebrough, New York City:

I claim the application of steam in a closed receptacle to bone-black or other filtering media, for the purpose of extracting the hydro-carbon oils remaining therein after filtration, whether the steam is made in the receptacle or conducted therein.

55,241.—KNITTING MACHINE.—William W. Clay Philadelphia, Pa.:

I claim, 1st, The combination of the needles, C, carriers, D D′, a jacquard apparatus, and the within-described devices, or their equivalents, whereby the needles can be transferred from one carrier to another by the operation of the jacquard apparatus, for the purpose described.

2d, The guides, L, L′, in combination with the within-described devices or their equivalents, and with a jacquard apparatus for the purpose specified.

3d, The bars K, K′, K″, with [illegible] recesses, n, in combination with the adjustable plate, O, and spring-catch, h, or its equivalent, the whole being arranged and operating as and for the purpose set forth.

55,242.—BOTTLE-FILLER.—Theodore Cochen, Williamsburg, N. Y.:

I claim, 1st, Placing a valve at the discharging end of the siphon, and operating the same by an automatic movement, said valve consisting of the aperture, P, the packing-ring, u, the sheath, R, r, and spring, v, or their equivalents, substantially as set forth.

2d, The peculiar arrangement of the parts which produce a uniformity of supply and discharge, viz.: the valve, D, valve-stem, F, nut, I, and float, G, when in combination with the reservoir and siphon, substantially as and for the purposes set forth and described.

55,243.—COMBINED DRILL AND FERTILIZER.—George E. Cooper, Baltimore, Md.:

I claim, 1st, In combination the hopper having two compartments, D, D2, the reciprocating rod, E, E, provided with two or more pins, e, e e2, e2, to each of the holes, the pins being arranged so as to project horizontally over the seed apertures, and with pins, e1 projecting upwardly as and for the purpose set forth.

2d, In combination with the above, I claim the cam, F, lever, G, studs, H, H, and pins, h, the whole being arranged and employed substantially as and for the purpose herein set forth.

3d, The combination of the lever, J, bar, I, link, K, pivoted crank, L, and slides, M, M, for the purpose of closing and opening the discharge apertures of the hopper simultaneously with the raising and lowering of the drill tubes.

55,244.—LOCK.—Walter Corbett and William Burns, St. Louis, Mo.:

We claim, 1st, The combination and arrangement of the bridge, B, and wards, a, a*, and key-hole bushes, a′, as above recited.

2d, The tumblers, C, when constructed with the toothed notches, c, and the notches, c′, and also in connection with the post, b3.

3d, The combination of the stop, G, with the above-described lock, as and for the purpose set forth.

4th, The construction of the bolt, D, with two notches, E and E′, as and for the purpose set forth.

5th, The combination and arrangement of the various parts of this lock, viz.: the bridge, B, the wards, a′ and a*, and key-hole bushes, a′, the tumblers, C′, the port, b3, and the stop or catch, G.

55,245.—ANIMAL TRAP.—George G. Cottrell, Sharon, Conn.:

I claim, 1st, The double ridges or holding jaws, M′, N′, M2, N2, arranged to operate substantially as and for the purpose herein specified.

2d, The knife edges or narrow bearings, D′, E′, arranged substantially in the manner and for the purpose herein set forth.

3d, The spits formed on the pan, D, substantially in the manner and for the purpose herein set forth.

55,246.—HORSE HAY-FORK.—C. N. Culver, Bowling Green, Ohio:

I claim the arrangement of the levers, H and I, in combination with the hook, G, ring, a, links, p, and forks, A, A, operating in the manner and by the means substantially as described.

55,247.—INNER SOLE.—Lyman Daggett, Boston, Mass.:

I claim the flexible inside water-proof elastic sole, as made with the supporting projections extending from its lower surface, and with passages around and between such, and holes leading therefrom up through the sole, the whole being substantially as described.

55,248.—FRUIT JAR.—Reuben M. Dalbey, Springfield, Ohio:

I claim, 1st, The lugs or projections, a, having notches on their under surfaces, as and for the purpose set forth,

2d, In combination with a jar having the serrated projections, I claim the yoke, B, and the cam-headed lever, D, arranged to operate as shown and described.

55,249.—MANUFACTURE OF WHITE-LEAD AND SALT-PETER.—Clarence Delafield, Factoryville, N. Y.:

I claim, 1st, The application of a jet of steam to a solution of the nitrate of lead or to a solution of the carbonate of potash (or their equivalents for this purpose), or to the united or combined solutions of nitrate of lead and carbonate of potash (or its equivalent for this purpose), for the purpose of aiding in the production of the white lead of commerce, substantially as set forth.

2d, The production of saltpeter or nitrate of potash as the residue of white lead manufactured after the process, substantially as described.

3d, Raising the temperature of the solutions of the nitrate of lead and the carbonate of potash after their union or combination, either by the use of hot steam or by the application of other heat, to aid in the production of the white lead of commerce, substantially as described.

55,250.—WIND-POWER.—Michael Depue, Mattoon, Ill.:

I claim the combination and arrangement of the sliding canvas door, K, with the drum, C, L, B, substantially for the purpose set forth.

55,251.—MEAT-CUTTER.—Joseph Derr, Oley, Pa.:

I claim the construction, arrangement, and combination of the cutters, H and I, and cleaners, J, when operated as herein described and for the purpose set forth.

55,252.—ABDOMINAL SUPPORTER.—Ellen Dexter, Quincy, Ill.:

I claim the combination of the apparatus, substantially as described, with the pad, h, the former so constructed as to envelop the entire abdomen and sustain it both vertically and horizontally, and operating in such manner as, while the pad exerts a special pressure immediately above the "os pubis" on the "pelvic viscera," the lateral displacement of the same is prevented by the pressure of the supporter, and the adjacent parts of the abdomen are restrained from enlargement consequent on the pressure of the pad.

55,253.—PROCESS FOR PULPING WOOD.—John W. Dixon, Philadelphia, Pa.:

I claim, 1st, The circulation of a highly-heated solution of lime in water or of magnesia in water, or a mixture of lime-water and magnesia under pressure, through a mass of woody fibrous material contained in a digester as a process or preparatory process for making paper pulp.

2d, The above process, in combination with a circulation of highly-heated fresh water under pressure through the immersed mass, either as a precedent or subsequent operation to the one first claimed.

55,254.—TATTING SHUTTLE.—A. Dobrowshy, Shasta, Cal.:

I claim as a new article of manufacture a tatting shuttle, composed of two sides, A, A, center-piece, B, and pin, C, extending beyond the sides, A, A, at one or both ends, as shown and described.

55,255.—LAMP FOR VEHICLES.—S. P. Dodge, Boston, Mass.:

I claim, 1st supporting the lamp upon springs, c, in combination with the posts, d, and sockets, e, substantially as described.

I also claim the perforated cylinder, h, extending down into the oil chamber and surrounded with fibrous material, as and for the purpose substantially as set forth.

55,256.—FIELD AND GARDEN CULTIVATOR.—Edward L. Dorsey, Union, Ind.:

I claim, the rod, B, arranged and used as and for the purposes set forth.

2d, The reversible and adjustable plows and rakes, M, N, secured to the axle, K, said axle being attached to the upright, B, by means of an adjustable plate, H, arranged and used as and for the purposes set forth.

3d, The block, R, with the plows, P, arranged in the manner substantially as herein specified.

4th, The guides, W, arranged and used as and for the purpose herein set forth.

5th, The plow-beam, A, with guide-wheel, F, upright, B, and shovel, M, in combination with the axle, K, wheels, L, L, shovels, M, N, and block, R, when used as and for the purposes specified.

55,257.—STEERING APPARATUS.—Sidney M. Dumont, Frank Dupraz, and G. Dickason, Vevay, Ind.:

In the described combination with the double cone-shaped pilot-wheel hub, A, A′, we claim the compensating sheave-pulleys, C, C′, as described and for the purpose specified.

55,258.—ATTACHING HOOP-SKIRT WIRE.—John E. Earle, New Haven, Conn.:

I claim a shoulder formed upon one or both ends of the wire so that the two ends may be secured together, substantially as herein set forth.

55,259.—GATE.—Robert R. Earnest, Springfield, Ohio:

I claim a gate having its horizontal bars pivoted at each end, as shown, in combination with the brace, c, pivoted at its lower front end, and having its notched end arranged to operate in connection with the loops, f, and block, O, as set forth.

55,260.—LADY'S MUFF.—Thomas Eckert, New York City:

I claim as a new article of manufacture a muff constructed with an air-chamber, a, hoop, c, and inflating valve, b, as and for the purpose specified.

55,261.—APPARATUS FOR SEPARATING METALS FROM ORES.—John H. Elward, Polo, Ill.:

I claim, 1st, The process herein described for separating the precious metals from ores, and amalgamating them as set forth.

2d, The combination of a cupola a series of saturating vats, and an elevator, substantially as and for the purpose set forth.

3d, The combination of a cupola with a heating chamber having crushers and scrapers, arranged and operating substantially in the manner and for the purpose set forth.

4th, The combination of a furnace, lead bath, and reservoir, arranged and operating substantially as and for the purpose set forth.

5th, The stirrers, L, combined with the guide-trough, K, substantially as and for the purpose set forth.

6th, Passing the products of combination escaping from the cupola and heaters, through an exhaust-pipe kept charged with moisture, into a reservoir of water substantially in the manner and for the purpose set forth.

55,262.—SWAGE FOR SHARPENING SAW-TEETH.—James E. Emerson, Trenton, N. J.:

I claim, 1st, A swage for sharpening the teeth of saws, provided with a guiding-groove, h, substantially in the manner described and operating for the purpose set forth.

2d, The manner, substantially as herein described, of forming and sharpening the teeth of saws, and securing uniformity in their width and thickness by means of a pin, adjustable transversely through the punch, as described, having dies to be used successively in combination with a punch or swage, as set forth.

55,263.—FORGING, SHEARING, AND PUNCHING DEVICE.—J. E. Emerson, Trenton, N. J.:

I claim an anvil, shears, and punching-machine, arranged, combined, and operating substantially in the manner and for the purpose set forth.

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55,264.—WOOD-BENDING MACHINE.—Owen Evans, Alliance, Ohio:

I claim, 1st, The arrangement of the staple, h′, form, B, and plate, n, in combination with the head, E, block, F, clasp, I, and key, d′, as and for the purpose substantially as set forth.

2d, The construction of the lever, L, guide, P, arm, p, in combination with the catch, J, and head, E, as and for the purpose substantially as described.

55,265.—SOFA AND CRIB.—E. E. Everitt, Philadelphia, Pa.:

I claim, 1st, The combination of the box or frame, A, the adjustable frames, C, C, and cushions, D, D′, the whole being constructed and arranged for joint operation, substantially as and for the purpose set forth.

2d, The combination of the cushion of a sofa bedstead, and a frame, E, hung to the cushion so as to be turned beneath or outwards at right-angles to the latter, substantially as and for the purpose set forth.

3d, The combination of the above and a leaf, F, or equivalent device for supporting the frame, E, at any required angle to the cushion, for the purpose set forth.

55,266.—HOOP SKIRT.—Marks Fishel, New York City:

I claim, 1st, Embracing the hoops of skirts within holes in tapes or analogous material of a single thickness, when the holes are produced without removing or cutting any of the fabric and fit around the hoops, substantially in the manner and for the purpose herein set forth.

2d, Combining with tapes punctured by the hoops as shown, the clasps, D, embracing the hoops and performing the double function of preventing the moving of the hoops in the tapes and of preventing the twisting or doubling of the tapes, as herein specified.

55,267.—INSTRUMENT FOR PUNCTURING FABRICS AND INTRODUCING FLAT SKIRT-WIRE THEREIN.—Marks Fishel, New York City:

I claim the sharp-pointed needle, C, having a form flattened and hollow at the large end, smoothly rounded throughout, adapted to be used in inserting the flat springs through close material, substantially in the manner and for the purpose herein set forth.

55,268.—STOVE-PIPE THIMBLE.—Charles H. Fitch, Auburn, N. Y.:

I claim, 1st, The top-plate, D, and bottom or end plate, G, with the cylinders, A and B, constructed and combined as and for purposes set forth.

2d, Closing the ends of the cylinder, A, under the bottom and over the top, in the manner and for the purpose above described.

55,269.—STOCK FOR BROOM-HEADS.—A. D. Forbes, Rockford, Ill.:

I claim the combination in a broom-head of the malleable iron clamp with the wrought-iron stem, when formed and united substantially in the manner and for the purpose described.

55,270.—HORSE-SHOE NAIL.—Thaddeus Fowler, Seymour, Conn.:

I claim as a new article of manufacture a horse-shoe nail in which the point of junction of the body with the head is more dense or stiffer than the body portion of the nail, the point is beveled upon one side (without being spread widthwise) and the head has a projection in the central parts, for the purpose and as set forth.

55,271.—CAR COUPLING.—Edward J. Frazier, Peoria, Ill.:

I claim the grooved pendulated key when suspended in a slotted opening as described, in combination with the coupling-pin as specified, for the purposes set forth.

55,272.—PLANING MACHINE.—Andrew Fuller, Milford, N. H.:

I claim the method herein described of working lumber across the grain, by the use of one or more rotary cutters or scrapers fixed or secured in the cutter-head, G, so that their planes shall pass through the axis of motion of the head, G, in combination with a table or platform to support the lumber to be fed to the cutter, the whole being arranged and operating as shown in Fig. 2 of the accompanying drawings.

55,273.—APPARATUS FOR AMALGAMATING GOLD AND SILVER WITH LEAD.—H. L. Fulton, Chicago, Ill.:

I claim the arrangement in combination of the amalgamating vessel, B, its partition, D, the hollow cylinder, A, with its helical shaft, C, its hopper, E, its spout, F, and its opening, G, in the manner and for the purposes specified, substantially as described.

55,274.—BRICK MACHINE.—Benjamin M. Gard, Champaign county, Ohio:

I claim, 1st, Making the bottom of the clay tub of a conical form when used in combination with a tapering screw for forcing the clay into the mold underneath the tub, in the manner and for the purpose herein described.

I also claim a sectional plate, d, held to its place by wooden pins that will break when a stone gets jammed in by the screw, and give way, thus preserving the machine from greater damage, as described.

I also claim making the scraper-shank adjustable, in combination with the pivoting of the scraper on said shank, as and for the purpose described.

I also claim, in combination with the pressure-plate, g, on the top of the table, the rise, h, in the track, o, underneath said plate, for the purpose of giving the clay additional pressure over what it receives from being packed in by the screw, substantially as described.

I also claim, in combination with the mold, a locking and unlocking mechanism, that is automatically operated, for locking and unlocking the lid of the mold at stated intervals, as set forth.

I also claim, in combination with the pin, j, having a bolt-head on its top, the cam, K, on the under side of the lid, so that the rounded surfaces may meet without liability of the lid jamming the bolt, and thus preventing it from falling into its proper position, as described.

55,275.—SMITH'S TONGS.—John C. Gardner, Hingham, Mass.:

I claim the combination with a pair of tongs of a segmental strip, B, and pawl, D, substantially as and for the purpose specified.

55,276.—CRACKER MACHINE.—W. M. Garrison, New York City:

I claim, 1st, The combination of the cutting-bars, F, with the grooved rollers, C, D, substantially as herein set forth for the purpose specified.

2d, The combination of the conducting-tubes, I, with the cutting-bars, F, and the recessed endless platform, H, substantially as herein set forth for the purpose specified.

3d, The sliding-frame, L, carrying the dotters, T, and arranged in relation with the recesses, r′, of the endless platform, H, substantially as herein set forth for the purpose specified.

55,277.—ROCK DRILL.—Stephen F. Gates, Boston, Mass.:

I claim a rock drill, when made with cutting edges, arranged substantially as and for the purpose specified.

55,278.—HORSE HAY-FORK.—Edward Gilliam, Allegheny, Pa.:

I claim the rod, A, provided with the head-piece, B, furnished with slots, e and o, when used in combination with the lever, D, rod, C, and barb or prong, B′, the whole being constructed, combined, arranged, and operating substantially as herein described and for the purpose set forth.

55,279.—PLOW.—Theodore Gilson and Nicolas Martin, Port Washington, Wis.:

We claim the land-side, D, in combination with the flanges, G, b, and share, C, as and for the purpose specified.

55,280.—LAMP.—R. A. Goodyear, New Haven, Conn.:

I claim the construction of the drip-cup attached to the metal cup which covers the fluid vessel or reservoir, as and for the purpose shown and described.

55,281.—CHURN.—Benjamin Graham, Lyons, Iowa:

I claim the beater, B, the screen, P, and the shield, S, all for the purposes as above set forth.

55,282.—MACHINE FOR BENDING WOOD.—Darwin A. Greene, New York City:

I claim, 1st, The short links, E1, E2, short arms, D1, D2, shaft, d, and stols, a, arranged as represented, relatively to each other and to the lever, D, and yoke, C′, or their equivalents, substantially as and for the purpose herein specified.

2d, The hinged arm, J, shaft, g, spring, H, and handle, G, arranged in operation in connection with the lever, D, and its connections, substantially in the manner and for the purpose herein specified.

55,283.—DEVICE FOR PICKING COTTON.—John Griffin, Louisville, Ky.:

I claim, 1st, The tube, D, with the cylinders, E, F, and plates, a, within cylinder, E, in combination with the cylinders, N, O, piston, c, and plunger, e, with the tubes, Q, R, S, the tubes, Q, R, communicating with an exhaust-chamber and tube, S, provided with an orifice, e*, and to be opened and closed by the thumb of the operator, substantially as and for the purpose set forth.

I further claim the piston, K, working within the cylinder, L, and connected with the flap, H, as shown, and the cylinder, L, communicating with the cylinder, F, substantially as and for the purpose specified.

55,284.—CAPPING WOOD SCREWS.—Charles T. Grilley, New Haven, Conn.:

1st, In the manufacture of capped screws, I claim placing the screw which is to be capped in an inverted position, or head downwards, together with its cap, in the closing die, constructed and arranged as described, so that the cap, while held in its proper relation to, may be closed on the screw without disfiguring or closing up the nick in the cap, as herein shown and set forth.

2d, In machinery for capping screws, as described, I claim providing the closing die with a punch, whereby the ready adjustment of the cap to the screw may be effected as herein shown and set forth.

3d, In machinery for capping screws, as herein set forth, I claim the combination of the closing die and center-punch with the recessed plunger or drop, for joint operation, as described, so that the cap may be adjusted to and closed in the screw while the nick in the cap is kept open, as shown and set forth.

4th, In combination with the closing die, provided with a center-punch, I claim the yielding support, as herein shown and described and for the purposes set forth.

5th, In combination with the closing die and center-punch and yielding support, as described, I claim the employment of a screw for adjusting and holding in place the center-punch, as herein shown and set forth.

55,285.—WATER-SPREADING NOZZLE FOR FIRE-ENGINES.—William Gurley, Troy, N. Y.:

I claim, 1st, The placing of a spreader for the nozzles of engines, pumps, etc., within a plate, so that the spreader may be adjusted over the orifice of the nozzle, or moved off from it bodily or entire, by the movement of a single part, D, substantially as shown and described.

2d, A spreader composed of a series of frustums of cones placed one within the other, and arranged so as to form a single or entire part, substantially as shown and described.

55,286.—SELF-INSERTING FAUCET.—Samuel N. Haight, Bedford Station, N. Y.:

I claim the combination of the open space, E, with the sloping cutting edges, b, b, and the channel or groove, c, of the arched and detachable cutter, substantially as and for the purpose described.

55,287.—CHURN.—Alexander W. Hall, New York City:

I claim the combination of a swinging or vibrating dasher with the swinging body of a churn in such manner that, by the act of moving the body in one direction, the dasher is moved in an opposite direction, substantially as herein set forth for the purpose specified.

55,288.—STEP LADDER.—Horace P. Hammond and William A. Hathaway, North Kingston, R. I.:

We claim the link, D, provided with a series of notches, a, a, a, in combination with the stud pin, b, or its equivalent, and the frame of a step-ladder, substantially as described for the purpose specified.

55,289.—TRANSMITTING MOTIVE-POWER.—Thomas Hanson, New York City:

I claim giving the required reciprocating motion to a pump or pumps for raising water by means of pistons working in separate cylinders and having water or other non-elastic fluid interposed as a medium for communicating the motions, substantially as described.

55,290.—CARPET-BAG FRAME.—George Havell, Newark, N. J.:

I claim, 1st, The combination of the "frame" of carpet, traveling, and other similar bags of three pieces, when combined and arranged substantially as set forth.

2d, The particular form of the central piece, E, when constructed in the manner and for the purpose set forth.

55,291.—LAMP CHIMNEY-CLEANER.—Ezra T. Hazeltine, Warren, Pa.:

I claim the herein-described instrument for cleaning lamp chimneys by adhesion of an intervening fibrous substance, consisting of a pad, A, of india-rubber or its equivalent, rod, C, and handle, B, constructed and operating substantially as set forth.

55,292.—BRONCHIAL TROCHE.—Samuel C. Henszey, Jr., West Chester, Pa.:

I claim the use of muriate of ammonia as compounded with certain other parts or ingredients herein named, or the component parts as combined, compounded, and made into a troche or lozenge, substantially in the manner and for the purpose as herein specified.

55,293.—SCHOOL DESK AND SEAT.—George W. Hildreth, Lockport, N. Y.:

I claim, 1st, The lever, a, moving upon the pivot, c, between the center of the lever and the back end thereof, when said lever (or seat) is sustained in a sitting position, by the back end of the lever, bearing against the stop, d, on the frame, as herein specified.

2d, The tapering pivot, c, with the corresponding socket in a, bolt, f, and jamb-nut, g, as and for the purpose described.

3d, The spring, i, and stops, d, d, for the purposes herein specified and shown.

55,294.—METHOD OF MAKING MOLDS FOR CASTINGS.—James G. Holt, Chicago, Ill.:

I claim, 1st, The devices, arranged and combined substantially herein described, for regulating the descent of the plunger, with respect to the height of the flasks in which the molds are made, for the purpose set forth.

2d, The combination of the projections, k2, with the follower of the press, for forming the branch sprue holes, k1, substantially as described.

3d, The combination of the press and its follower with the opening, H1, and flask, H, all constructed as described in the manner shown, so that molds for axle skeins and boxes may be pressed, substantially as set forth.

4th, The perforated follower, B, in combination with the sectional flask, H, H′, and patterns, h, h, for the purpose substantially as described.

55,295.—MACHINE FOR PREPARING AXLE-SKEIN MOLDS.—James G. Holt, Chicago, Ill.:

I claim, 1st, The machine constructed and operating substantially as herein described for cutting, sleeking, and packing the walls of sand-molds for casting axle-skeins, which molds have been previously prepared by patterns, substantially as described.

2d, The means, substantially as herein described, whereby said molds, which have been prepared by patterns substantially, as described, are subject to the operation of rotary and vertically moving and laterally sliding tools, which are adapted for finishing said molds, substantially as set forth.

3d, Providing the tool, F, which finishes the molds, with one or more movable cutters, constructed and operated substantially as described, for producing the undercutting in the molds, substantially as described.

4th, The combination of molding tools, F, with a vertically sliding frame, C, and also with devices which will admit of these tools being rotated about their axes for finishing molds, substantially as and for the purpose described.

55,296.—MODE OF PREPARING MOLDS FOR HUB-BOXES.—James G. Holt, Chicago, Ill.:

I claim, 1st, Making the interior form of a sand-mold for hub-boxes by means substantially as herein described, the said means being constructed and operating substantially as set forth.

2d, The combination of movable plates, J, and sliding plate, F, with a tapering tool, F, for finishing sand-molds for hub-boxes, substantially as described.

55,297.—CIDER MILL.—S. J. Homan, Walden, N. Y.:

I claim the adjustable knife, E, operating in combination with the scrapers, C, of the cylinder, B, in the manner and for the purpose herein specified.

55,298.—SASH-FASTENING.—William W. Hosford, New Britain, Conn.:

I claim the combination of cams, k, e, with the plate, a, spring i, and arm, O, arranged and operating substantially as and for the purpose described.

55,299.—CONSTRUCTION AND MANUFACTURE OF PRINTING-TYPE.—Thomas S. Hudson, East Cambridge, Mass.:

I claim the said manufacture of printing-type, made substantially as described, viz.: by the combined processes of stamping the letter or figure from a plate or piece of metal, and subsequently reducing the same in manner and for the purpose set forth.

55,300.—CONSTRUCTION OF PRINTING-WHEELS, ETC.—Thomas S. Hudson, East Cambridge, Mass.:

I claim the new manufacture of the printing or type-wheel prism, cylinder, or plate, consisting of the supporting part, B, and the printing band or chain, A, made with concavo convex types, and applied to such part, B, substantially in manner as described.

55,301.—ROTARY ENGINE.—Robert Hughes, Dangerfield, Texas:

I claim, 1st, The construction of the stationary head, E, with curved point, G, and its steam channels, D and T, as herein described.

I also claim the construction of the valves, K, arranged in the valve-box, I, as herein described.

I also claim the arrangement and combination of the valves, K, center-head, E, cam G, and channels, D and T, to operate in a cylinder as a rotary-engine, whereby to utilize the exhaust steam, and operating other machinery as herein set forth.

55,302.—CLAMP.—P. F. Hurlbert, Chatham, N. Y.:

I claim the combination of the angular bar, A, and serrated cam lever, arm, c, admitting of operation to the right or left, for the purpose herein specified.

55,303.—DETACHING BOATS FROM THEIR DAVITS.—Thomas Huntington, New Rochelle, N. Y.:

I claim the hooks, B, suspended or fitted in the plates, A, in combination with the arms, c, attached to the shaft, C, all being applied to the boat, and arranged to operate substantially in the manner and for the purpose set.

55,304.—HARVESTER.—John Jann, New Windsor, Md.:

I claim, 1st, The arrangement of the lever, H, bars, I, I, slides, F, clutches, E, ratchet, D, and springs, K, as and for the purposes specified.

2d, The slotted bar, O, in combination with the pivot-bolt, M, for making a stiff joint between the cutting apparatus and its connections.

3d, The combination of the double bar, N, hook, Q, slotted link, R, segments, S, pinion, U, and lever, T, all arranged and operating as described.

55,305.—PORTABLE DOOR-FASTENER.—E. H. Janney and E. J. Hamilton, Fairfax, Va.:

We claim, 1st, The short stationary pivots of the case, A, in combination with the slotted swinging and sliding hooked holdfast, B, substantially as described.

2d, The combination of the oblique slots, short pivots, hooked holdfasts, B, and stop, d, in construction of a portable night-lock, substantially as described.

3d, The combination of the notches, S, and shoulder, k, in the construction of the portable night-lock, substantially as described.

55,306.—WASHING MACHINE.—James Hervey Jenkins, Yorkville, N. Y.:

I claim, 1st, The arrangement of the cylinder, B, and spring-plate, C, rollers, M, M, and board, O, as and for the purpose herein specified.

2d, The revolving hollow brush-cylinder, P, provided with brushes at its exterior and interior surfaces, and open at one end, substantially as and for the purpose specified.

3d, The arrangement of the pressure-rollers, M, M, spring, k, perforated board, o, and case, A, for the purpose specified.

4th, The arrangement of the pounders, I, rod, K, and crank, g, suitably operated, in combination with the perforated box, J, within the partition, h, in the manner and for the purpose herein specified.

5th, The arrangement of the treadle-frame, F, slotted upright bar, G, crank, e, and shaft, D, constructed and operating in the manner and for the purpose herein described.

55,307.—ROCK DRILL.—Lemuel P. Jenks and Geo Arthur Gardner, New York City:

We claim, 1st, Suspending the machine bearing-slide, M, upon the same center with the disk, M, in combination with the arrangement whereby the slide, N, can be fastened at any angle, substantially as described.

2d, The standard-block, H*, in combination with the gibs or friction pieces, J, J, when the same is used with rock drills, and constructed substantially as shown, for the purpose of giving universality of motion, horizontally, all substantially as described.

3d, Regulating the feed of a rock drilling machine toward the rock, according to the extent of penetration of the drill into the same, by the arrangement constructed and used substantially as described.

4th, The arrangement of a screw-shaft and nut, for the purpose of raising and lowering the machine, when used with rock drills, and constructed substantially as described.

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55,308.—STOP-MOTION FOR KNITTING MACHINES.—Edward Kay, Philadelphia, Pa.:

I claim, 1st, The machine as a whole, composed of the parts combined, arranged, and operating substantially as set forth.

2d, The pin-wheel, M, the sliding-plate, O, and the lifting-plate, P, combined and arranged substantially as set forth.

3d, The sliding-plate, O, the lifting-plate, P, and the shifting-lever, R, combined and arranged as herein specified and described.

4th, The sliding-plate, O, the shifting-lever, R, and the spring, S, combined and arranged substantially as set forth.

55,309.—ROW-LOCK.—James B. Kelly, Kendallville, Ind.:

I claim, 1st, The combination of the circular plates, B and C, having rollers interposed between them, with an oar, D, substantially as described.

2d, Constructing the base-plate, B, with a central stud, a, for receiving, centering, and keeping in place the movable plate, C, to which the oar is affixed, substantially as described.

3d, Constructing the anti-friction rollers, G, G, with flanges, e, e, on them, in combination with the annular projections on the plates, B and C, substantially as described.

55,310.—WASHING MACHINE.—William Kelly, Saranac, Mich.:

I claim, 1st, The rod, g, with ratchet, j, in combination with the slotted plates, m, and rubber, E, the whole constructed as and for the purpose herein set forth.

2d, The shaft, P, furnished with double cranks in combination with rods, L and T, in connection with plates, K, and tub, B, the whole constructed and operating in the manner and for the purpose herein specified.

55,311.—BUCKLE.—George R. Kelsey, West Haven, Conn.:

I claim the combination of the frame (Fig. 3) with the tongues (Fig. 4) when they are constructed, attached, and fitted for use, substantially as herein described and set forth.

55,312.—PLOW.—Martin Kennedy, Boston, Mass.:

I claim, 1st, The handle, C, having the wedge-shaped opening, p, at its lower extremity in combination with the pins, o, sole, A, standard, B′, and bolt, e, for attaching the handle to the plow, substantially as described.

2d, The hooked beam, D, in combination with the standards, B, B′, and bolts, a and h, for attaching the beam to the plow, substantially as described.

3d, The hinged mold-boards, M, M, constructed with their surfaces turned in at the bottom as described, and hinged to front standard, B, in combination with the hinged plates or pieces, m, m, and piece, d, for adjusting the mold-boards to any angle, the whole being constructed and operated in the manner and for the purpose set forth.

55,313.—CHURN-DASHER.—A. Kirlin, Rock Island, Ill.:

I claim the combination of the double dasher-shaft, in combination with the pump-rod, when arranged together substantially as and for the purpose described.

55,314.—STUMP EXTRACTOR.—William Langdon, Langdon Station, Pa.:

I claim the eccentric short arm of the lever of the first kind in connection with the chain and hook, substantially as described.

55,315.—MACHINE FOR PRESSING LEAD PIPES.—Robert Layng, New York City:

I claim the bridge, g, attached to the end of the lead cylinder and sustaining the core-holder, f, in combination with the ram, e, formed with an opening or mortise through which said bridge passes, substantially as and for the purposes specified.

55,316.—BROOM HEAD.—Josephus Liget, Posey Township, Ind.:

I claim the handle, D, provided with the mortise, E, and the set-screw, C, in combination with the socket, A, all arranged substantially as set forth and described.

55,317.—COLLAR AND NECK-TIE SUPPORTER.—C. L. Lockwood, New York City:

I claim a plate or retainer, adapted for confinement in front of a shirt collar, a bow or tie, and devices whereby the bow may be secured to or detached from the retainer, the whole being constructed and adapted to each other, substantially as described.

55,318.—ROTARY PUMP.—Henry Maas, Homestead, Iowa:

I claim the disk or ring, C, having a series of plates, J, hung in and to the same, when arranged within a casing having an outlet and inlet opening thereto, in such a manner that it can be rotated, and the said casing is so constructed as to operate the said ring-plates, J, substantially in the manner and to accomplish the purpose described.

55,319.—CARRIAGE SPRING.—G. S. Manning, Springfield, Ill.:

I claim, 1st, The S-shaped springs, D, either with or without the strengthening leaf or leaves, K, constructed and connected to the axle and to the supporting arm of the carriage-body, substantially as described and for the purpose set forth.

2d, The connection, J, constructed as described in combination with the supporting arms, H, I, substantially as and for the purpose set forth.

55,320.—CHURN.—David Marshall, Genoa, N. Y.:

I claim, 1st, The arrangement of the spindle, F, cam-wheel, I, and slider, J, when made substantially as specified and used for the purpose set forth.

2d, The sleeve, K, ring, L, and elastic rings, M and M, when made and applied as herein specified.

55,321.—TOBACCO-PIPE.—René Masson, Tremont, N. Y.:

I claim, 1st, The pipe, e, extending down near to the bottom of the globe, B, when the same is applied in combination with the bowl and stem of a smoking-pipe and with the chamber, C, substantially as and for the purpose described.

2d, The plug or stop-cock, f, in combination with the channels, c, d, chamber, C, globe, D, and with the bowl and stem of a smoking-pipe, constructed and operating substantially as and for the purpose described.

55,322.—GATE.—Henry Maxell, Canton, Ohio:

I claim, 1st, The gate, A, with the arm, K, pivoted to the block, g, and upright, L, by means of the L-shaped bar, E, when arranged and used substantially as and for the purpose herein set forth.

2d, The bars, B and B′, with the slotted bar, C, when used to slide in the slots of the uprights of the fence for the purposes of opening and closing the gate, A, substantially as specified.

55,323.—WATER-WHEEL.—Thomas McAuley, San Francisco, Cal.:

In combination with the water-wheel described, I claim the discharge-nozzle, N, arranged outside of the wheel and the dash-board, D, for joint operation, substantially as described.

55,324.—APPARATUS FOR CARBURETING AIR.—S. T. McDougal, New York City:

I claim, 1st, The combination of the float, E, and the valve, D, with the carbureter, A, for the purpose of regulating the admission of oil thereto, substantially in the manner herein described.

2d, In combination with a carbureter, containing a series of pans arranged one above another, I claim the valve, N, when operated by means of the wire, P, or its equivalent, substantially as and for the purpose specified.

55,325.—MOTIVE-POWER.—J. McKnight and Wm. S. Deisher, Reading, Pa.:

We claim, 1st, The hub, C, the ratchet-wheels, E, E, cams, F, F, wheels, G, G, collars, D, D, and shaft, B, arranged and used in the manner and for the purpose herein specified.

2d, The arrangement of the cams, F, F, the chains, f, f, and the springs, g, g, within the frame, A, substantially as and for the purpose herein specified.

3d, The rods, h and i, the arms, j, j, the shaft, k, and the bar, e, arranged and used as and for the purpose herein specified.

55,326.—GATE-LATCH.—James W. McLean, Indianapolis, Ind.:

I claim the latch, A, with projections, D and E, when constructed and operating substantially as and for the purposes set forth.

55,327.—LUMBER REGISTER.—Francis McManus, Ellenburg Center, N. Y.:

I claim the barrel, n, with pawls, n′, n2, ratchet-wheel, l, and suitable train of wheels, connecting the axes, a2, b2, c2, d2, e2, etc., in combination with the cord, m, spring, o, and stationary cap, p, constructed and operating substantially as and for the purpose specified.

55,328.—GAS GENERATOR.—John McWilliams, Pittsburg, Pa.:

I claim the arrangement of the stove, A, gas-generator, C, furnished with a conformed bottom, e, rack, f, pipes, h and g, and vessel, m, arranged, constructed, and operating substantially as herein described and for the purpose set forth.

55,329.—MANUFACTURE OF SHOE-BINDING.—M. H. Merriam and E. L. Norton, Charlestown, Mass.:

We claim the improvement in the manufacture of shoe-binding, substantially as described.

55,330.—SLITTING MACHINE.—M. H. Merriam and E. L. Norton, Charlestown, Mass.:

We claim, 1st, The combination with the rotary cutters of the stationary and the pressure-guides or guide-surfaces by which the strip is maintained in position, as presented to the action of the cutters.

Also, in combination with such cutters, the fingers extending between the cutter-blocks and keeping the material in position during the action of the cutters.

Also, combining with such rotary cutters the draw-rolls, operating substantially as set forth.

55,331.—SORTING MACHINE.—M. H. Merriam and E. L. Norton, Charlestown, Mass.:

We claim, 1st, The combination with contact surfaces, between which the strip of leather is placed or passed, of an index mechanism operated by the movement of the movable contact surface, substantially as set forth.

Also, the employment of the feed-rollers in combination with the index mechanism, one of the rollers operating the index by its movement, substantially as set forth.

Also, overhanging the rollers which feed the material and operate the index mechanism.

Also, making the rollers or the roller-frame adjustable as to hight, so as to set the index-pointer to the starting-point of the dial.

55,332.—MACHINE FOR WINDING SHOE-BINDING, TAPE, ETC.—M. H. Merriam and E. L. Norton, Charlestown, Mass.:

We claim, 1st, The employment of the independent cheeks or disks, for supporting the tape or ribbon as it is being wound, in combination with the removable arbor, i, upon which the coil is formed, substantially as described.

Also, the removable and slit arbor forming the core or spindle upon which the coil is wound.

Also, the employment of a measuring wheel driven by contact of the rotating coil, when such coil is formed and supported between disks, substantially as described.

Also, so connecting the measuring wheel with the mechanism by which the coil is wound that the rotation of the coil shall be automatically stopped when the determined length is wound, substantially as set forth.

55,333.—APPARATUS FOR DRYING HIDES.—M. H. Merriam and E. L. Norton, Charlestown, Mass.:

We claim, 1st, A series of sliding panels, arranged within a drying chamber or case and made movable with respect to an opening or door in such case, so that each panel as it is brought opposite such opening may be wholly or partially withdrawn from the casing for the attachment and removal of the skins.

Also, in combination with the series of panels, and the movable rails which support the same, we claim a stationary frame having ways upon which each panel is guided and supported as it is slid from the drying chamber.

Also, the radial arrangement of the movable series of panels in the drying chamber, substantially as set forth.

Also, the combination with the stationary case and movable system of sliding panels, of heating pipes or their equivalents, substantially as set forth.

55,334.—GLUING PRESS.—M. H. Merriam and E. L. Norton, Charlestown, Mass:

We claim, 1st, In combination with the platen and its bed, a guide-piece upon each side of the platen, for bringing the strips to be united into line, substantially as set forth.

Also, the employment of an identifying mark upon each of a series of platens, as and for the purpose specified.

Also, hanging the platen so that it may swivel to accommodate the acting face of the plated to the surface of the strip beneath it, substantially as set forth.

55,335.—GLUING AND CEMENTING MACHINE.—M. H. Merriam and E. L. Norton, Charlestown, Mass.:

We claim the combination of the cement-containing vat, the rotating cement cylinder, and the scraper, operating together in the manner and for the purpose substantially as set forth.

55,336.—CUTTING MACHINE.—M. H. Merriam and E. L. Norton, Charlestown, Mass.:

We claim, 1st, The arrangement of the cutter-blocks to slide upon their shafts when they are kept in relative position by a spring or springs upon the end of one or both of the cutter-shafts, substantially as described.

Also, the combination of two series of tapes holding the skins in position and feeding them to the action of the cutters, with two series of disk-cutters, which divide the skins into strips, substantially as set forth.

Also, the combination with cutters which divide the skins of a series of tapes conducting the material to and carrying it in strips from the action of the cutters.

Also, the employment of the auxiliary tapes which, in connection with the main tapes, keep all the strips in position until the skin is cut entirely through.

Also, hanging the drums around which the upper tapes pass upon swinging frames, so that pressure of the upper tapes upon the skins is maintained, substantially as set forth.

55,337.—POTATO-DIGGER.—W. D. Miller, Enon, Ohio:

I claim, 1st, The combination of a laterally adjustable mold-plow with the gatherer of a potato-digging machine, substantially as described.

2d, The combination of the rake, D, with the plow and gathering devices of a potato-digging machine, for the purpose of gathering the vines, substantially as set forth.

3d, The combination of the mold-plow, a, rake, and a revolving fork or gatherer, for the purpose of digging potatoes, and substantially as set forth.

4th, In combination with the beam of the plow of a potato-digging machine, the cross-head, I, and frames, J and K, for the purpose of permitting an adjustment of the plow vertically or laterally, substantially in the manner set forth.

5th, The runners, R, in combination with the drag-frame which carries the revolving fork or gatherer of a potato-digging machine.

55,338.—AUTOMATIC BOILER-FEEDER.—William Moore, Kokomo, Ind.:

I claim, 1st, The swinging nozzle or its equivalent, constructed and arranged substantially as described.

2d, The combination of the swinging nozzle with the shaft, B, arranged in the support, R, with the pivot, L, substantially as described and for the purpose set forth.

3d, The combination and arrangement of the nozzle, a, shaft, B, and whistle, S, all constructed and arranged as and for the purposes set forth.

55,339.—PEAT MACHINE.—Arthur Moffatt, Washington, D. C.:

I claim, 1st, The cylinders, B and B′, in combination with the standard, C, arranged for the purpose of feeding, crushing, and grinding, substantially as and for the purpose herein set forth.

2d, The application of heat to the different parts of the machine, substantially as and for the purpose herein described.

3d, The cylinders, S and S′, having chambers, m, in combination with the plunger, o, operating substantially as and for the purpose herein described.

4th, The piston, O, having an endward movement forward and backward, in combination with the feeding openings, i and i′, operating substantially as and for the purpose specified.

5th, The ejecting-rod, O′, provided with a disk in each chamber, and operating as herein described, for the purpose set forth.

6th, The vibrating-rod, p, in combination with the clogged-wheel, r, and operating substantially as described.

55,340.—HEAT-GENERATING APPARATUS FOR COOKING PURPOSES.—Oscar J. Morrill, Chelsea, Mass.:

I claim, 1st, The employment of the inclined spur-wheel for effecting the adjustment of the wick by imparting a rotative spiral movement, substantially as set forth.

Also, the incasement of this wheel in the chamber or box, n, substantially as and for the purpose set forth.

Also, bending the teeth of the inclined spur-wheel, so that they act at right angles to the surface of the wick, substantially as described.

Also, in combination with the spur-wheel and spindle, the tube, o, extending up through the reservoir, substantially as described.

Also, giving to the feed-wheel such construction with reference to the wick which it rotates that its teeth shall not drag the threads from the wick-tube or become entangled therein, each tooth freeing itself from the wick before it reaches the surface of the tube through which the wheel projects, as described.

Also, the employment, in combination with a tubular wick and two foraminous cylinders, of a non-conductive or slow-conductive packing, p, over the top of the fluid-containing chamber, or between the flame and said chamber, substantially as described.

Also, in combination with a tubular wick and two foraminous cylinders, the packing, q, between the air-tube, l, and the wick-tube.

Also, supporting the inner flame-tube, g, upon this packing or a tube, r, extending therefrom.

Also, the passage, t, communicating from the upper part of the reservoir chamber with the wick chamber, substantially as described.

Also, so applying the outer wick-tube that there shall be a space, s, between the outer wick-tube and the outer flame-tube, which space is filled with the packing, p, substantially as described.

Also, making the supporting tube, r, and the upper part of the outer wick-tube of perforated metal, for the purpose described.

55,341.—VIAL FOR HOLDING SOLUTIONS.—Cyrus H. Morse, North Kingston, R. I.:

I claim a vial, bottle, or similar vessel, A, made with a funnel-shaped diaphragm, B, as described, in combination with the chamber, c, for the purpose specified.

55,342.—LINIMENT.—Richard M. Moyle, South Manchester, Conn.:

I claim Australian rheumatic white liniment, composed of ingredients in about the proportions substantially as described.

55,343.—CABLE-STOPPER.—Peter Murry, Milwaukee, Mich.:

I claim the combination of the movable jaws or jaw, C, C′, with the stationary pin or jaw, D, eccentrically slotted wheel, G, and lever, H, all constructed and arranged to operate substantially as and for the purpose herein described.

55,344.—CURTAIN FIXTURE.—G. W. Nell, Philadelphia, Pa.:

I claim a shade-cord-holder composed of a sliding rod, B, with screw-shank, D, spring, b, and tubular button, E, constructed and operating substantially as and for the purpose set forth.

55,345.—BROOM CLASP.—Peter H. Niles, Boston, Mass.:

I claim the spring-pin in combination with the protector, for the purpose and in the manner substantially described.

55,346.—HARBOR DREDGING BOAT.—William H. Nobles, St. Paul, Minn.:

I claim, 1st, The construction of the hull of the dredging steamer containing the water-tanks, P, and having upon its bottom surface the plow, L, when the bow or forward part of said dredge is constructed so as to draw less water than the stern and admitting across the center thereof an open space, B, for the introduction of plows or scrapers, as herein described and set forth.

I also claim the plows or scrapers, C, placed spirally on its shaft, E, operating on an upright movable frame, D, with the endless chains, W, sand-buckets, T, and pulleys, X, arranged and combined as herein described and for the purposes set forth.

I also claim the mode of filling the buckets, T, by means of the plows or scrapers, C, as herein described.

55,347.—STEAM DREDGING BOAT.—William H. Nobles, St. Paul, Minn.

I claim, 1st, The wheels, E, operating in square apertures, and located either obliquely or straight across the boat, having their plows, L, set spirally and obliquely, so as to make a clear channel, and throw the dirt to each side of the boat, when said devices are combined with the upper works or frame of a vessel greater in extent than the hull thereof, as herein described.

I also claim the combination of the spirally set plows, L, platform, C, and center-plow, T, when arranged upon a boat, as herein described and for the purposes set forth.

55,348.—HARNESS SADDLE-SEAT.—O. B. North, New Haven, Conn.:

I claim a saddle-seat, of the form described, cast in one piece, substantially in the manner as herein fully set forth.

55,349.—COMB.—Joseph P. Noyes, Newark, N. Y.:

I claim, as an improved article of manufacture, the folding comb, herein described, consisting of the two blades, A, B, metallic backs, C, D, and hinge-joint, E, made solid with the said metallic backs, all as specified.

55,350.—CAR TRUCK.—John Nusbaum, Alliance, Ohio:

I claim the shoe, D, with the flanges, e, and braces, E, F, in combination with the truck, in the manner and for the purpose set forth.

55,351.—HARROW.—William S. O'Brien, Brimfield, Ill.

I claim the arrangement and attachment of the eye-rods, a, a, a, to the screw-nuts, b, in the center harrow, for the securing and adjustment of the outer harrows, A′, A′, substantially in the manner and for the purpose as herein described.

55,352.—FENCE.—A. W. Olds, Green Oak, Mich.:

I claim the arrangement of the strips, A, B, C, and slats, b, d, in combination with the brace, f, and mode of connecting the pannels together, substantially as and for the purpose set forth.

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55,353.—COTTON-BALE TIE.—William Onions, St. Louis, Mo.:

I claim, 1st, The head, C, having the hook upon one side, substantially as and for the purpose described.

I also claim forming the head, C, plate, E, and rivet, a, of one and the same piece, as and for the purpose specified.

55,354.—HOSE COUPLING.—Jason C. Osgood, Troy, N. Y.:

I claim the screw and nut cut with double threads and leaving two or more of said double threads at the base of the screw and nut whole or uncut, in combination with the division into sections of the upper threads of the screw and nut, substantially as and for the purposes as herein set forth.

55,355.—VAGINAL SPRING.—Seth E. Parsons, Albany, N. Y.:

I claim the peculiar shape of the perforated bulb, A, and the long stem on the tube, B, in connection and combination with the rubber bulb, C, in the manner and for the purpose as herein set forth.

55,356.—CATTLE PUMP.—John S. Patric, Rochester, N. Y.:

I claim the combination and relative arrangement of the base, A, or its equivalent, and the jointed tilting-frame, B, D, its fulcrum, E, and counter-balancing weight, H, with the hollow piston or pipe, p, of the pump, as and for the purposes set forth.

55,357.—HYDRANT.—Joseph Paudler and Friedrik Bauschtliker, Washington, D. C.:

We claim the arrangement and combination of the grooved circular air and water chambers, R, S, valve, T, air-tubes, D, D, with the upright lever or wrench, L, for letting on or cutting off the supply of water, and the upright levers or wrenches, G G, to tighten the packing, K, as herein described.

55,358.—CASTER FOR FURNITURE.—J. C. Plumer, Boston, Mass.:

I claim, 1st, The use of a disk of rubber, leather, or other similar flexible material for the purpose of retaining the caster spindle in its place, in the manner set forth.

2d, The combination of the circular support, E, and the shoulders, F, as and for the objects specified.

55,359.—GENERATING AND SUPPLYING ILLUMINATING GAS.—E. A. Pond and M. S. Richardson, Rutland, Vt.:

We claim the method herein described of supplying gas generators or vaporizers of whatsoever construction from an independent air-pump or air-forcing apparatus located at any place convenient, but so that the air shall enter the said vaporizer, and become charged with the hydro-carbon vapor at or near the point where gas is to be consumed.

55,360.—CHURN.—S. T. W. Potter, Scott, N. Y.:

I claim, 1st, The floats, F, secured to the dasher-rods, g, constructed and arranged substantially as described.

2d, The scrapers, G, in combination with the floats, F, substantially as shown and described.

55,361.—CHAMBER VESSEL.—Andrew Rankin, New York City:

I claim the combination of the arms, G, and spindle, H, operating relatively with slotted-plate, F, of the vessel, B, having a nozzle, D, for the reception of the deodorizing agent, all arranged and applied in the manner herein described for the purpose specified.

55,362.—CORN-SHELLER.—Daniel K. Reeder, Elliottsburg, Pa.:

I claim, 1st, The combination of the double-toothed wheels, E, the concave holders, i, mounted on slats, c, provided with yielding springs, f, and the grooved hopper, D, all constructed and arranged substantially as and for the purposes described.

2d, The helical gains, h, in the concave holders, i, and for the purposes described.

3d, The teeth upon the wheels, E, set at an angle as described to the radii of said wheels, in combination with the concave holders, i, as and for the purpose described.

4th, The grooved floor of the hopper, D, in combination with the apertures, D′, substantially as and for the purpose described.

5th, The shaking inclined floor, G, and slotted screen, G′, in combination with the shelling machinery and revolving fan, substantially as and for the purposes described.

55,363.—MACHINE FOR COMPRESSING THE CYLINDERS OF CASKS UPON THEIR HEADS TO FORM A TIGHT BARREL.—William Reid, West Arlington, Vt.:

I claim the conical ring composed of sliding segments, operated substantially as described for compressing the shell in combination with the movable disk, or the equivalent thereof, for holding and controlling the shell to be compressed, substantially as described.

55,364.—BRACE FOR BITS.—Cromwell O. Richey, Aurora, Ind. Ante-dated May 16, 1866:

I claim the retaining bar, D, spring, E, ferrule, k, and slot, C, in combination with bit, B, and pin, b, arranged as above described, and for the purpose set forth.

55,365.—HOE.—Edwin Ritson and William W. Brigg, Mattaville, N. Y.:

We claim, 1st, A hoe composed of a back, A, shank, B, and ferrule, C, all cast in one piece and with teeth, D, secured to the back, A, in them anner substantially as set forth.

2d, Having the teeth, D, made in the form of a scaline triangle, with oblique side and attached to the back, A, in reverse position from the center outward, so that the oblique sides will face the center of the hoe, as shown and described.

55,366.—RIVET OR BOLT CUTTER.—D. D. Robinson, Niles, Mich.:

I claim, 1st, An improved machine for cutting off bolts or rivets formed by combining and arranging the eccentric levers, A, B, the jaws, C, D, and plates, E, F, G, J, with each other, substially as described and for the purpose set forth.

2d, The combination of the toothed and stop-plates, H, I, with the eccentric levers, A and B, substantially as described and for the purpose set forth.

55,367.—MANUFACTURE OF ARTIFICIAL FUEL.—Charles Saffray, New York City:

I claim, 1st, The within-described process of aggregating coal-dust or waste coal by first producing a powder of pitch or resin and coal-dust, which is mixed cold with the coal to be aggregated, and, after having been subjected to a suitable pressure, is dried, substantially as and for the purposes set forth.

Also, the product obtained by treating coal-dust or waste coal in the manner above specified.

55,368.—DENTIST'S CHAIR.—J. A. Salmon, Boston, Mass.:

I claim, 1st, The arrangement of the gimbal-ring, d, the journals, b, b, e, e, bearings, c, c, f, f, curved bars, g, l, and their bolts, l, m, with the chair-body, B, and the base or foot-frame, A.

I also claim the arrangement and combination of the movable foot-board supporting-racks, r, r, and their operative slide-rod, n, with the chair-body, B, the foot-board supporting-arms, p, p, with their cross-bar, t, and the crank-shaft, s, and band, w, for raising and lowering the foot-board, as specified.

I also claim the mechanism for adjusting the elevation of the chair-seat, the same consisting of the wheel, a′, with its scroll-flange, b′, rack, z, and the carrier, y, arranged and combined with the seat and the chair-body, substantially as set forth.

I also claim the improved head-rest hinged-joint, as made of the recessed cylinder, f, the pin, k′, the clamp-screw, m′, and the bearing, h′, constructed and arranged together as specified.

I also claim the combination of the cross-slot, n′, in the adjuster with the clamp-screw, m′, and the head-rest, E, applied together, substantially as described.

55,369.—TRUSS.—Howard Sargent, Boston, Mass.:

I claim the pad, A, as described, made of sponge, for the purpose set forth.

55,370.—SHEEP-RACK.—D. F. Sexton, Whiting, Vt.:

I claim, 1st, Arranging the troughs in a sheep-rack so that the same can be slid up and down in suitable guides, substantially as and for the purpose specified.

I also claim so arranging the division-strips, C, that a greater space shall be provided at the top than at the bottom, substantially as and for the purpose specified.

55,371.—METHOD OF PRESERVING VEGETABLE FIBER.—T. P. Shaffner, Louisville, Ky. Ante-dated April 10, 1866:

I claim, 1st, The process of imparting a pure metallic coating to fibrous substances by precipitation, by electrical action of a metal upon a metallic surface, previously given by saturation with a metallic solution and subsequent removal or evaporation of the water of suspension or evaporation.

2d, Saturating the fiber, fabric, or wood, as described, with a liquid containing plumbago in suspension for the purpose of imparting a metallic coating to said fibrous substances, upon which a film of metal may be afterward precipitated by electrical action.

55,372.—COTTON-SEED PLANTER.—N. B. Sherwood, Millville, N. Y.:

I claim, 1st, The vertically revolving feeder-belt, B, constructed and operating substantially in the manner and for the purposes herein shown and described.

2d, The fixed separating brush, E, arranged and operating substantially as and for the purposes set forth, in combination with the vertically revolving belt, B.

3d, The revolving discharge-brush, F, arranged and operating in connection with the belt, B, substantially as and for the purposes herein shown and described.

4th, The employment or use of the automatically adjustable back, G, of the grain or seed-hopper, in combination with the delivering devices.

5th, Constructing and arranging the parts so that the belt, B, whether verticle or inclined, shall constitute one side or end of the hopper or box, as set forth.

6th, So arranging and operating the toothed belt, B, or delivering devices in this class of seed-planters, as to convey the seed upward out of the hopper or box, for the purpose set forth.

55,373.—COTTON-SEED PLANTER.—N. B. Sherwood, Millville, N. Y.:

I claim the employment of the revolving separator-bush, B, arranged and operating in combination with the toothed delivery-belt, D, substantially as and for the purposes herein shown and described.

55,374.—HORSE-SHOE.—Francis Shinn, Rockport, Ill.:

I claim attaching the toe or calks of a horse-shoe to the plate, substantially as described, so that they shall be held to the plate by a single nail, which at the same time serves to hold the shoe to the hoof, and so that the removal of the single nail which holds a toe or calk shall permit it to be removed or replaced at pleasure without removing the plate.

55,375.—SAW.—Charles T. Shoemaker, Philadelphia, Pa.:

I claim, 1st, The tooth, B, its split projection, b, and grooved edges adapted to a recess in the saw, and screwed thereto by taper pins, m, m, or their equivalents, all substantially as set forth.

2d, A piece, D, formed, fitted to an opening in the saw, and adapted and secured to the tooth for the retention of same, all substantially as set forth.

55,376.—BRICK-DRYING PRESS.—John P. Shryock, Zanesville, Ohio:

I claim, 1st, The brick-drying apparatus herein described, consisting of the kiln, A, track or rail, B, B, car, C, tray, G, fire place, D, heating-flue, E, and stack, F, constructed and employed substantially as and for the objects specified.

I also claim the brick-bearing cars, consisting of the open frame, C, wheels, C, and axles, C2, constructed and arranged in the manner and for the purposes set forth.

55,377.—MEANS FOR WORKING SHIPS' PUMPS.—Lebbeus Simkins, Brooklyn, N. Y.:

I claim the connection of a suitable connection, such as the shafts, F, F, I, L, and bevel-wheels, H, J, K, or any other equivalent means in combination with the pump, A, and capstan, O, constructed and operating substantially as and for the purpose described.

55,378.—BURGLAR ALARM.—George Simpson, Waterbury, Vt.:

I claim the sliding-head, E, hinged taper-holder, m, on the guide-rod, l, spiral spring, r, friction-plates, q and n, lever, I, and catch, S, in combination with clock-work to produce the alarm and strike a light, substantially as described for the purposes specified.

55,379.—SUGAR-CANE MILL.—E. W. Skinner, Madison, Wis. Ante-dated December 5, 1865:

I claim, 1st, Arranging a guide or shed, N, provided with shoulders, O, O, between the lower rollers, to prevent the cane from running off the ends of the rear roller, as and for the purposes set forth.

2d, Arranging, beneath the journal bearings of the rollers the cups, a, provided with outlets, a′, substantially as and for the purposes described.

55,380.—RAKE-ATTACHMENT TO HARVESTERS.—Ephraim Smith, Clinton, Pa.:

I claim, 1st, The lifting-rods, d, d, d, when provided with the guard-fingers, f, f, f, projecting upward from their outer ends near the shaft on which they turn, substantially as and for the purpose herein specified.

2d, In combination with the above, I claim the arrangement of the disk, or wheel, G, with its cam pin and gear-teeth, and the disk or wheel, H, with its cam projection and gear-teeth, for giving the required movements to the lifting rods, substantially as herein set forth.

55,381.—CULTIVATOR.—H. B. Smith, Eureka, Ill.:

I claim, 1st, The constructing of the frame, A, in the manner substantially as herein shown and described to admit of said frame being expanded and contracted laterally to adjust the plows nearer together or further apart, as may be required, and admit of a direct application of the draught of each animal to the device, as set forth.

2d, In combination with the frame, A, thus constructed, I claim the pivoted beams, C, C, arranged or applied substantially as and for the purpose set forth.

3d, The connecting of the plow-beams, G, G, to the beams, C, C, by means of the universal joints, H^a, constructed substantially as shown and described, to admit of the vertical, lateral, and rolling motion of the plows, as set forth.

4th, The combination of the adjustable frame, A, pivoted beams, C, C, plow-beams, G, G, all arranged to operate in the manner substantially as and for the purpose set forth.

55,382.—HOLLOW AUGER.—James M. Smith, Seymour, Conn.:

I claim the combination of the hollow shank, A, cylinder, I, adjusting screws, H, and slides, all constructed and arranged substantially as described, so as to adjust the cutters and guides as and for the purpose specified.

55,383.—VAPOR BURNER.—Willard H. Smith, New-York City:

I claim the sleeve, E, the wick-tube, F, and the shield, G, combined and arranged in the manner and for the purpose herein set forth.

55,384.—POTATO-DIGGER.—Simon Soules, Dowagiac, Mich.:

I claim, 1st, The construction of the sides, A, A, of the form substantially as shown with fenders, g, g, in combination with the forward inclined shovel, D, and the inclined grating, G, substantially as described.

2d, In combination with the upright sides, A, and inclined shovel, D, and the inclined grating, G, I claim the rollers, c, c, and their tappets, d, substantially as described.

3d, The double-inclined grating, G, hinged and operated substantially as described.

55,385.—PIANO-FORTE.—William Steinway, New York City:

I claim, 1st, The use in piano-fortes of a metal case cast in one solid piece, consisting of the plate, a, braces, b, ra ters or brace-frame, c, and connecting-piece or flange running round on three sides of the case and supporting the regulating apparatus, leaving one side open for the insertion of the sounding-board, with its bars and bridges, substantially as described.

2d, The method herein desc ibed of supporting the sounding-board by means of screws, springs, wedges, wire-draws, or any other equivalent means, bearing on and bracing against the edges thereof, substantially as and for the purpose set forth.

3d, Supporting a number of the lowest steel strings and highest covered bass strings a second time between the regular sounding-board bridge and the hitch-pins, either upon a prolongation of the regular sounding-board bridge, or upon an independent bridge, for the purpose of equalizing the transition from the steel springs to the covered bass strings, thus preventing any break in the tone.

55,386.—LUBRICATING JOURNALS.—John J. Stevenson, Auburn, N. Y. Ante-dated May 22, 1866:

I claim the application of the self-oiling cup or box to the bearings of mowing and reaping machines, when used as and for the purpose above specified.

55,387.—PISTON-HEAD FOR STEAM ENGINES.—Edward Sullivan, Pittsburg, Pa.:

I claim, 1st, The use in piston-heads of steam engines, furnished with expanding packing rings, of one or more self-acting valves, for the admission of steam therein, each valve consisting of a single valve piston or plunger, so arranged that the live steam shall press on both ends of the plunger at the same time, and from the inside of the piston-head and the other from the outside, the area of the two ends of the valve-plunger differing in proportion to the relative desired pressure of the steam on the exterior of the piston-head, and on the packing-rings within the piston-head, substantially as and for the purpose herein-before described.

2d, The combination of the valve-cylinder, g, piston, p, and stem, q, forming a self-acting valve for the admission of steam into the interior of the piston-heads, for regulating the pressure of steam on the packing-rings, constructed and operating substantially as herein-before described.

3d, Combining with the piston-head of a steam engine having expanding packing-rings, a device, constructed and operating substantially as herein-before described, so as to retain the live steam which enters the piston-head, and obviate the frequent change of steam, thus preserving a constant and uniform pressure on the packing-rings, and preventing the shuffling motion of the rings consequent on the continued passage of steam in and out of the piston-head.

55,388.—APPARATUS FOR COLLECTING FLOATING OIL FROM STREAMS.—E. C. Summers, Huntingdon, Pa.:

I claim, 1st, The combination of the boards or planks, B, with the bent sheets of iron, C, when arranged to form a floating boom for collecting surface oil, substantially in the manner herein-before described.

2d, The combination of the trough, D, with the trough or boom, A, for confining the oil and water as it passes through the former, to effect the more perfect action of the chute, E, substantially as described.

3d, The combination of the chute, E, with the trough, D, and tank, I, when arranged to operate substantially as described and for the purposes specified.

55,389.—PLANING MACHINE.—John B. Tarr, Chicago, Ill.:

I claim, 1st, The construction of the mouth-piece, B, B, e, f substantially in the manner herein described and shown.

2d, The arrangement of the mouth-piece, B, B, slide, b, spring, c, in relation to the cutter, A, substantially in the manner herein described and shown.

55,390.—BED-BOTTOM.—Peter Taylor, Pawtucket, R. I., and William A. Gove, Charlestown, Mass.:

We claim, 1st, The combination and arrangement of the arms, c (projecting from the frame, A), with the elastic or india-rubber straps, and their supporting rollers, applied to the frame, B, the whole being substantially as specified.

2d, The combination of the buckle, or equivalent take-up mechanism, with the arms, c, and the elastic strips applied to the frames, A and B, substantially in manner as specified.

3d, The combination of the straining plates, F, the elastic straps or springs, their supporting rollers, and the arms, c, the whole being arranged together and with the frames, A and B, substantially in manner and so as to operate as specified.

55,391.—TOOL FOR CUTTING-OFF BOILER TUBES.—Nicholas Thomas, Chicago, Ill.:

I claim an improved tool for cutting off boiler tubes, constructed and arranged substantially as herein described and for the purpose set forth.

55,392.—CALL BELL.—Horace A. Thompson, Hartford, Conn.:

I claim the hinge pad, d, in combination with the bell, a, striking knob, e, arranged and operating substantially as and for the purpose described.

55,393.—MAGNESIUM LAMP.—Robert H. Thurston, Providence, R. I. Ante-dated Jan. 4, 1866:

I claim, 1st, Feeding magnesium upwards to the point where combustion is to take place, from below the flame, by a regular motion, to be determined by the rate at which combustion proceeds, in the manner substantially as described.

2d, The combination of curved guides, b, b′, or guides arranged in a curve with the mechanism for feeding a ribbon or ribbons of magnesium, so that the section of such ribbon or ribbons, where combustion takes place, shall be circular.

3d, Combining with such guides a clearer, c, constructed and operated substantially as described.

4th, The combination of a bucket-wheel, A, having a continuous rotary motion, as described, with a set or sets of feeding rollers, a, a′, arranged and operated substantially as specified.

55,394.—BROOM CLASP.—Howard Tilden, Boston, Mass.:

I claim the improved broom strap or clasp described, to wit, a broom strap or clasp made of two loops, connected by two springs, substantially as described.

55,395.—GAS APPARATUS.—Oakes Tirrill, Burlington, Mass.:

I claim, 1st, In generating illuminating gas from hydro-carbon fluids, the method described of heating the fluid in a coil or other suitable apparatus which shall be outside of and separate from the generator and yet at the same time so connected and combined therewith as to cause the fluid to circulate freely and continuously through the said coil or other apparatus and generator, as and for the purposes herein shown and set forth.

2d, In combination with apparatus for generating gas as described, I claim the employment of a spiral coil of pipe or tubing outside of the gas generator, and connected therewith by means of pipes or other suitable device, together with a burner for heating the said coil, substantially as herein described and for the purposes set forth.

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3d, In combination with the spiral coil of pipe or tubing, as set forth, I claim the double jacket and cap fitting over said coil, and arranged substantially as and for the purposes herein shown and described.

55,396.—Transit Instrument.—William S. Trowbridge, Milwaukee, Wis.:

I claim, 1st, The attaching of the extra telescope by extending the shaft of the transit instrument, for the purpose of describing angles from one to ninety degrees.

2d, The attachment of the graduated quadrants or quadrant on the transit instrument, in combination with the telescope or telescopes and the table or tables for ascertaining the horizontal and perpendicular, by taking the angle or surface measurement of slopes in incline of ground passed over.

55,397.—Till Lock.—Cyrus Tucker, La Crosse, Wis.:

I claim, 1st, The independent guards, D, constructed as shown and described, and mounted vertically in the frame, C, as set forth.

2d, In combination with the guards, D, I claim the bolt, F, arranged to move vertically and engage in the notches of the guards, as set forth.

3d, In combination with the bolt, F, provided with the arm, r, I claim the pivoted dog, E, arranged to operate as set forth.

4th, The pawl, n, arranged to operate in combination with the dog, E, and arm, r, as herein described.

5th, The bell, H, having its hammer, g, provided with the lever, f, arranged to operate in combination with the arm, r, as set forth.

55,398.—Apparatus for Inhaling Gases.—P. H. Van der Weyde, New York City:

I claim, 1st, The construction of the apparatus described for the generation, preservation, but particularly for the administration of anæsthetic gaseous substances, so that the injurious products of the respiration are absorbed by the passage of the expired gas, by a separate channel, through an appropriate alkaline solution, and all waste of the expired gas is thus avoided.

2d, The attachment of a strong cylinder able to stand the pressure of at least fifty atmospheres, containing the laughing gas condensed to its liquid form, of which a portion by the simple partial opening of a stop-cock expands, cools, and supplies the common breathing bags, or what is better the above described inhaling apparatus with any desired quantity of fresh coal, and perfectly pure nitrous oxyd gas.

55,399.—Corn Planter.—Charles A. Wakefield, Pittsfield, Mass.:

I claim, 1st, The inside scraper, A, applied to the rear surface of the plunger, in combination with the scraper, b, applied to the front surface thereof, substantially as herein set forth for the purpose specified.

2d, The side scrapers, C and d, applied to the plunger substantially as herein set forth for the purpose specified.

3d, The oblique tongue or feather, e, working in the notch, f, of the slide, g, to operate the said slide, substantially as herein set forth for the purpose specified.

4th, The zig-zag deflectors, n, in the feather, e, operating the slide, g, substantially as herein set forth for the purpose specified.

55,400.—Brick Machine.—Philip N. Walliston, Springfield, Ohio:

I claim, 1st, The mixer or kneader shaft, C, having a scraper, K, at its lower end, in combination with the scraper, N, when arranged together and so as to operate substantially in the manner described for the purpose specified.

2d, So arranging the scraper, N, that its movement can be adjusted at pleasure, substantially as and for the purpose described.

3d, The arrangement of the molds, V3, in combination with the followers or plungers, F2, when so operated as to move up and down, substantially in the manner described for the purpose specified.

4th, Forming apertures in the molds, as and for the purpose specified.

5th, The rock-shaft, N2, connected with the sliding-arm, Q2, in combination with the lug, V2, or its equivalent, upon the rotating disk, D2, when arranged together and with the endless traveling apron, U so as to operate substantially in the manner and for the purpose described.

6th, The disk, D2, having cam-shaped flanges in combination with the molds, V3, and followers, F2, connected with the said flanges, and all arranged together so as to raise and lower the said molds and followers, substantially as and for the purpose specified.

7th, Forcing the clay from the kneading-mill through openings corresponding in shape to that which it is desired to impart thereto, according as bricks, tiles, etc., are to be made from it substantially as described, the clay as it is forced through said openings passing to the molds to be operated upon by them, for the purpose specified.

55,401.—Cradle, Stool, and Chair.—Joseph B. Warren, Danversport, Mass.:

I claim the cradle pivoted, j, with box, h, in the rocker-frame and the adjustable portions, j, d, A and B, B, as above described for the purposes herein set forth.

55,402.—Table Mat.—Charles Weber, West Meriden, Conn.:

I claim a table mat, made as herein described, and provided with a metal frame, substantially as and for the purpose specified.

55,403.—Car Truck.—Levi H. West, Cambridge, Mass:

I claim the combination and arrangement of the elastic fulcra or the springs, c, c, with the said frames, A, B, and the levers, D, D, or the same and the springs, F, F, the whole being substantially as and so as to operate as specified.

55,404.—Knife-polisher and Knife and Scissors Sharpener.—Jonathan Wheeler, Athol, Mass.:

I claim an improved combined knife-polisher and knife and scissors sharpener formed by combining the emery-wheels, F and G, and tempered steel-cutters, H, I and J, with each other, and with the shaft, D, and spring, N, the whole being constructed and arranged substantially as described and for the purpose set forth.

55,405.—Steam Generator.—Norman W. Wheeler, Brooklyn, N. Y.:

I claim, 1st, The frames, c, c, c, when arranged around and secured to the shell of a vertical tubular boiler, substantially as and for purposes described.

2d, The circulating-pipe, g, in combination with the water bottom, h, and the crown-sheet of the furnace, D, D, when such crown-sheet is also a flue-sheet for the tubes, B, B.

55,406.—Packing Slide-valves for Steam Engines.—Norman W. Wheeler, Brooklyn, N. Y.:

I claim the ports, i, i, in combination with packing-rings or segments thereof expanded by their own elasticity or by special springs, substantially as and for the purposes described.

55,407.—Churn.—H. Whisler, New Market, Ohio:

I claim the combination of the wheels, B and m, the ears, S, and the dashers, E, the whole constructed and operating in the manner and for the purpose herein set forth.

55,408.—Horse Hay-fork.—Peter A. Wise, Stockbridge, N. Y. Ante-dated Dec. 5, 1865:

I claim, 1st, The metallic shank, a, attached to the head of the fork and passing into the slotted end of the handle, c, to which it is attached by the cross-bolt, b, in combination with the latch, d, as and for the purposes specified.

2d, The combination of the fork hinged to the handle, a suspending bail, and a brace extending from the handle to the bail, substantially as specified.

55,409.—Broom.—Joel Wisner, Aurora, N. Y.:

I claim, 1st, The employment of the adjusting-bar, E, in combination with the head-block, B, substantially in the manner and for the purpose described.

I also claim suspending the holding-plate, E, by the screws, D, in combination with the fixed head-block, as shown and described.

55,410.—Sash and Door Bolt.—H. T. Woodman, Dubuque, Iowa:

I claim the combination of the bolt, A, slotted sleeve or casing, B, connecting link or rod, D, and crank-arm, E′, of shaft or spindle, F, suitably formed for receiving a handle-knob, key, or other equivalent device, when arranged together so as to operate substantially in the manner described and for the purpose specified.

55,411.—Machinery for making Wire Sieves.—E. B. Bigelow, Boston, Mass., and Charles H. Waters, Groton, Mass., assignors to Clinton Wire-cloth Company.

We claim, 1st, The cutting apparatus, constructed and operated substantially as described.

2d, The forming apparatus, constructed and operated substantially as described.

3d, The expanding fastener, constructed and operated substantially as described.

4th, The method of manufacturing wire-cloth sieves by the successive use of the cutting apparatus, cutting the sieve-bottoms diagonally across the web of the cloth, forming apparatus for turning up the edges of the sieve-bottom, and the expanding fastener for distending the sieve-bottoms, substantially as described.

55,412.—Lathe.—L. L. Crane, assignor to Leavitt, Crane & Company, Cleveland, Ohio:

I claim the ways, m, m, when arranged in the same plane, but in an angular or inclined position in relation to the ways, n, n, and centers, g, e, the ways, n, n, being in line or parallel to each other, and the centers, g, e, all combined and operating conjointly in the manner and for the purpose set forth.

55,413.—Mop-wringer.—John M. Enos, assignor to himself and Franklin Smead, St. Joseph, Mich.:

I claim the combination and arrangement of the wringer, C, when constructed substantially as shown with the mop, M, mop-head, A, and handle, B, provided with a pin, a, operating substantially as specified, and for the purposes set forth.

55,414.—Meat-chopper.—Calvin A. Foster, assignor to A. F. Spaulding and S. M. Scott, Winchendon, Mass.:

I claim, 1st, The combination of the raising arm, I, with either or both the knives and the operative mechanism, and supporting frame thereof.

I also claim the combination as well as the arrangement of the post, g, and its turn-button, h, or the equivalent thereof, with the frame, A, and the raising arm, I, and one or more knives, G, G, and mechanism to operate such knife or knives, substantially as described.

I also claim the operative mechanism of each knife, G, the same consisting of the knife-carrier, H, the vibratory arm, e, and the rotary crank, d, arranged substantially as specified.

I also claim the application of the tub-cover to the raising arm, I, so as to be lifted off the tub thereby when such arm is in the act of being elevated, substantially as set forth.

I also claim the application of the plow, K, to the raising arm, I, so as to be lifted out of the tub thereby, when such arm is in the act of being raised as explained.

I also claim the mechanism for imparting to the tub an intermittent rotative motion and enabling the tub to be separated from the cross of such mechanism, the same consisting of the stud, x, the cross or their equivalents, the internal ratchet, r, the pawl, s, the bent lever, u, the connector, v2, and the arm, w, projecting from the carrier, as set forth.

55,415.—Planing Machine for Cutting Slats for Blinds.—Martin Free, assignor to Alfred Louderback, Philadelphia, Pa.:

I claim the reciprocating carriage, C, D, carrying the cutters, c′, c′, and operating automatically the devices which feed the block, E, to the same as described, the said feeding devices consisting of the lever, G, pawl, H, springs, I, I, stud wheel, J, screw-shaft, f1, f2, f3, and gear-wheels, F, F′, F, constructed and arranged substantially as described.

55,416.—Mail Bag.—John Fye, assignor to himself and John F Sutherland, Hamilton, Ohio:

I claim the construction of the mouth of the bag as shown at F, in combination with the cover as shown in Fig. 2, and the weight at the bottom of the lining, D, for the purposes set forth.

55,417.—Spool-thread Regulator for Sewing Machines.—William H. Hawkins, assignor to himself and James D. Orne, Rochester, N. Y. Ante-dated May 30, 1866:

I claim the adjustable thread-regulator herein described, the same consisting of the slotted arm, C, D, b, sleeve, a, sliding arm, E, and plate, F, arranged to operate in the manner and for the purpose specified.

55,418.—Treating Wood, Straw, etc., for Manufacture of Paper-pulp.—H. L. Jones and D. S. Farquharson, assignors to themselves and Albert M. Hastings and Alexander McVean, Rochester, N. Y.:

We claim, 1st, The subduing of straw, wood, or any fibrous material to be converted into paper pulp, by subjecting the same to the action of alkali liquor of any desirable temperature applied under the hydrostatic pressure of the liquid itself applied by a force-pump or otherwise, instead of using steam pressure, preparatory to the bleaching of such material in the ordinary methods, substantially as shown.

2d, The combination with the cylinder, A, of the pump, D, and pipe, B, substantially as and for the purposes above set forth.

3d, We claim the safety-valve, K, in combination with the pump, D, below the piston or plunger and in direct communication with the pump-barrel, substantially as above described.

55,419.—Stove-pipe Drum.—Werner Kroeger, assignor to himself and Constantine Ries, Milwaukee, Wis.:

I claim a heat-radiator composed of three concentric cylinders, a, b, b′, c, in combination with two horizontal partitions, g, g′, and dampers, h, h′, all constructed and operating substantially in the manner and for the purpose herein set forth.

55,420.—Knitting Machine.—M. T. Lamb, assignor to himself and Isaac W. Lamb, Valparaiso, Ind.:

I claim, 1st, Attaching the counter to the sliding frame in such a manner that the movement of the sliding frame will carry the teeth of the dial against a stationary pawl or ratchet, substantially as and for the purpose herein described.

2d, The changer, G, consisting of a bent wire, or its equivalent, attached at its ends to the cam-shifters, p, and so placed that the operator can operate it with one hand while he turns the machine with the other hand, substantially as described.

3d, Constructing and applying the changer, G, to the cam-shifters, p, of a knitting machine, in such a way that it can be removed at pleasure without alteration in the machine, substantially as shown.

55,421.—Making Eyelets.—William R. Landfear, assignor to himself and David Whittemore, Hartford, Conn.:

I claim the combination and arrangement of the lever, or its equivalent, the socket and knife, or the same and the supporting plate, the same being to operate substantially in manner and for the purpose as set forth

55,422.—Take-up Mechanism for Circular Knitting Machines.—John Lessels, assignor to Clark Tompkins, Troy, N. Y.:

I claim the combination in the take-up mechanism of a knitting machine of the following instrumentalities, viz., the take-up roller, screw-shaft (having an endwise movement), vibrating pawl, and movable stop operated by the screw-shaft, all operating substantially as set forth.

55,423.—Saw.—John Lippencott, assignor to himself and Thomas Bakewell, Pittsburg, Pa.:

I claim, 1st, The use of tapering saw teeth or teeth points inserted into correspondingly shaped slots in the saw plates, having their sides flush with the side of the saw plate and secured from lateral displacement therein, without riveting or upsetting, by the groove in the edges of the slot in the saw plate and correspondingly shaped edges of the tooth (or groove in the edges of the tooth and beveled edges of the slot), substantially as herein-before described.

2d, The use of saw teeth or teeth points bifurcated at the rear end, and with or without a head or projection at the extremity of the prongs, for insertion into the plates of circular or long saws, substantially as and for the purposes herein-before set forth.

3d, The tapering slot in the saw plate for the insertion of the removable teeth, with an enlargement, or operating at the rear end, for the purposes herein-before set forth.

55,424.—Floor Clamp.—Aaron Lloyd, assignor to Francis Hamblin, Mattoon, Ill.:

I claim hinging the prop, G, to the handle, A, when used for the purpose of a floor clamp, constructed and operating in the manner as herein described and represented.

55,425.—Operating Dies for Forming Articles of Metal.—Eli J. Manville, Waterbury, Conn., assignor to himself and Sidney L. Clark, Torrington, Conn.:

I claim, 1st, Two or more dies fitted to move radially in a stock, in combination with an adjustable tappet or tappets revolving around the said stock, and acting directly upon the outer ends or edges of said dies, substantially as set forth.

2d, Pairs of radial dies, formed with their contiguous edges beveled or at an inclination, as specified.

55,426.—Process for Preparing Stuffing for Currying.—C. L. Morehouse, assignor to himself and J. B. Merriam, Cleveland, Ohio:

I claim, 1st, The above-described mode or process of clarifying paraffine oil by the use of a blast of air in jets for agitating the oil, while treating the same with a large proportion of sulphuric acid, thus checking the excess of chemical heat, substantially as set forth.

2d, The use of hot water in washing the oil, substantially in the manner and for the purposes set forth.

3d, The use of a blast of air from the ice chamber for crystallizing the paraffine, substantially as set forth.

55,427.—Harvester.—David R. Paiste, assignor to Reese, Lake, Melick & Co., Willistown, Pa.:

I claim, 1st, The finger-bar, F, with its bar, J, in combination with the K′, and the grooved pulley, a, secured to the frame of the machine, the whole being arranged and operating substantially as and for the purpose described.

2d, The combination with the above of the adjustable lever, E, substantially as and for the purpose herein set forth.

55,428.—Hot-air Engine.—S. H. Roper, assignor to Elmer Townsend, Roxbury, Mass.:

I claim providing the auxiliary air-passage, j, with the safety-valve, k, when arranged to operate substantially as described and in combination with the inlet-pipe, c, and its throttle-valve, g.

55,429.—Mop.—James Sangster and Milton Boyd, assignors to Joseph B. Lichtenstein, Buffalo, N. Y.:

We claim, 1st, The combination with said rollers, F and G, of the guide-plates, or their equivalents, when constructed as and for the purposes herein substantially described.

2d, In combination therewith, we claim the thumb-piece, D, spring, E, and bar, H, as described.

55,430.—Lifting-jack.—Thomas Sheldon, Enfield, Conn., assignor to himself and Henry Inman, Portland, Maine, and E. P. Furlong, West Brook, Maine:

I claim a lifting-jack as herein described, and combining the various parts, in the manner and for the purposes set forth.

55,431.—Combined Hook and Button.—William H. Shurtleff, assignor to himself and Henry A. Church, Providence, R. I.:

I claim the combination of a button with a shank, secured at the periphery and bent under and down at a point diametrically opposite of the button to constitute the lacing-stay, substantially as herein shown and set forth.

55,432.—Brick Machine.—John Watson, assignor to Oran W. Seeley, Buffalo, N. Y.:

I claim the combination of the slotted-rod, D, with the cam, I, when used to give an irregular reciprocating motion to the molds of a brick machine, for the purpose and substantially as herein described.

55,433.—Measuring Pump.—S. H. Wheeler, assignor to himself, Richard Hedden, James Thompson, and Robert B. Thompson, Dowagiac, Mich.:

I claim, 1st, The enlarged chamber, C, upon the upper end of the pump-barrel, having a check-valve, a, in it, as arranged in relation to the valve, c, on the rod, D, and caged piston, c′, substantially as described.

2d, Providing the upper end of the piston-rod, D, with a cone or circular wedge, F, for actuating the registering devices at every descent of the piston, substantially as described.

3d, The vibrating lever, i, spring, j, pawl, h, and arm, k, in combination with the ratchet-wheel, g′, disk, g2, and a circular wedge, F substantially as described.

4th, In a pump having a registering device applied to it, I claim providing for regulating the length of the piston-rod, by means substantially such as described.

5th, In a pump having the registering device applied to it, I claim the use of a valve, c, c′, applied to the piston-rod, substantially as described.

55,434.—Knitting Machine.—James G. Wilson assignor by mesne-assignments to Union Seamless Knitting Machine Company, New York City:

I claim, 1st, The employment for the purpose of controlling the direction and changes of direction of the rotary motion of the needle-ring or needle-bar of a knitting machine, of a studded wheel or drum, so constructed, applied, and operating that it performs its duty without any movement in a direction parallel with its axis, as herein described.

2d, So constructing and operating the aforesaid wheel or drum, having no movement in a direction parallel with its axis, that it will make but one revolution during the operation of making a complete stocking or other knitted article, as herein specified.

3d, Combining the aforesaid studded wheel or drum having no movement parallel with its axis, with a slide, H, and pawls, h, h′, or their equivalents, which produce the rotary movement of the needle-ring of a circular knitting machine, by means of a three-armed lever, K, L, L′, constructed, applied, and operating substantially as herein specified.

4th, Giving the studded wheel or drum a compound rotary motion, viz.: a slow motion to bring its studs to an operative position, and a quicker motion to produce the action of its studs upon the needle-ring or needle-bar, substantially as herein described.

5th, The employment in a circular or straight knitting ma-

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chine of the specified kind herein described of a system of needles having longitudinal and lateral movements alternately, and operating substantially as herein specified.

6th, The combination with a system of needles having a longitudinal reciprocating motion when used in a machine constructed specifically as herein described, of a system of yarn conductors so applied as to deliver yarn to immediately adjacent or consecutive needles, substantially as herein specified.

7th, The plate I', either fitting between two projections, c, c', on the needles, as represented in the drawing, or, what is equivalent grooved to receive single projections on the needles, and operating substantially as and for the purpose herein specified.

8th, The vibrating presser applied and operating in combination with a laterally and longitudinally moving series of needles, substantially as herein specified.

9th, Combining the yarn-guides and presser substantially as herein specified, to be operated by the same mechanism.

10th, The combination of a system of needles and a system of yarn guides operating automatically in conjunction with a yielding compressor and bridge for carrying and removing the needles without the use of stitch-hooks for taking off the stitches, in such manner as to knit simultaneously on two or more immediately adjacent or consecutive needles, substantially as herein described.

11th, The combination of the studded wheel or drum, M, having no movement parallel with its axis, and a series of needles and yarn conductors so applied as to effect the knitting simultaneously with separate yarns on immediately adjacent needles.

55,435.—Pitman-head for Harvesters, etc.—Silas H. Wilson, assignor to Wm. H. Brown, Auburn, N. Y.:

I claim so combining and uniting the crank wrist and pitman of a harvesting or other machine, through a box and oil cup, as to admit of a triplicate motion between the wrist and pitman, to prevent all binding or cramping, as also clatter between the parts, substantially as described.

55,436.—Lamp Chimney.—George L. Witsil, Philadelphia, Pa., assignor to himself and John F. Cabot, Elizabeth, N. J.:

I claim a lamp chimney which has the winding or spiral groove formed in it, substantially as described.

55,437.—Attaching Axes to their Handles.—Henry C. Wooding; Wallingford, Conn., assignor to himself and L. W. Turner, Galesville, Conn.:

I claim the herein-described wedge provided with a head and constructed so as to be secured, substantially in the manner specified.

55,438.—Bottle-stopper.—Howard Busby Fox, Oxton, England:

I claim, 1st, The within-described soft-lined cap, b, c, d, adapted to close the mouths of bottles or vessels having a screw-thread formed on the outer surfaces of said mouths by screwing thereon and to fit tightly not only upon the edge, but also along the surfaces of the screw-threads, substantially as and for the purpose herein specified.

2d, In connection with the above, I claim the divided or serrated edge, e, of the rigid portion of the cap, b, to facilitate the bending inward thereof to confine the soft lining, substantially as herein specified.

55,439.—Paddle Wheel.—James Goodier, Chester, and J. F. Kilshaw, New Brighton, England:

We claim the cam or piece, b, with grooves, n, elbow-pieces, l, links, K, and gabs, j, arranged and operated substantially as herein specified.

55,440.—Reaping Machine.—Richard Hornsby, Spittlegate, England:

I claim the combination of diagonal chains or bands for removing the cut grain, with a movable platform provided with slots or openings, as described.

55,441.—Galvanic Battery.—George Lionel Leclanche, Paris, France:

I claim the use in electrical piles of insoluble or slightly soluble salts of copper or other equivalent material moistened with a liquid containing a salt in solution capable by its decomposition of rendering the said salts of copper or other equivalent material, soluble as described.

55,442.—Casting Steel.—Anton Lohage, Unna Westphalia, Prussia:

I claim, 1st, The process herein-before described, and called intermediate process, whereby I continue the melting process till the mass is "overmelted" or "superheated," made uniform and ready for casting.

2d, The modes herein-before described of altering the temper of the molten steel in the intermediate process.

55,443.—Photographic Rest.—Oliver Sarony, Scarborough, England:

I claim the combined arrangement of an upright sliding bar or bars, b (in a suitable stand), the plate, g, the part, h, with means of receiving a curved slide, l, the slide, n, and the stems or bars, k and o, substantially as herein described, and combined therewith the supports for the body and head, as described.

55,444.—Knitting Machine.—John Thornton and William Thornton, Pease Hill Rise, near Nottingham, England:

We claim the combination of the looping instruments with the mechanism for operating them and with the thread-guides, in such manner that said instruments are caused to make a partial rotation upon their axes and have thread laid and loops formed on them in the two positions occupied by them and at opposite sides of the fabric, substantially as set forth.

54,445.—Hitching-post.—Valentine Ward, San Francisco, Cal.:

I claim, 1st, The post or shell, A, sunk underneath a sidewalk or pavement, having an extension shaft or bar, P, to be drawn from or inserted in said post or shell at will, substantially as described and for the purpose set forth.

2d, The spring, E, or its equivalent, when arranged as above described, or by weights and pulleys, when a larger post is desired, substantially as described and for the purpose set forth.

RE-ISSUES.

2,262.—Process for rolling India-rubber Cloth.—[Div. A.]—Francis D. Hayward, Malden, Mass., and Ira E. Sanborn, Boston, Mass., assignees of John C. Bickford. Patented March 19, 1850, and extended. Re-issued March 20, 1866:

We claim the new or improved process of applying rubber or caoutchouc when reduced to plastic consistency onto cloth, substantially as herein described—that is to say, by means of two contiguous rolls revolving in opposite directions, one carrying the cloth to be coated; the other the coat of rubber to be applied; the latter revolving at a higher rate of speed than the former.

2,263.—Process for rolling India-rubber.—[Div. B.]—Francis D. Hayward, Malden, Mass., and Ira E. Sanborn, Boston, Mass., assignees of John C. Bickford. Patented March 19, 1850, and extended. Re-issued March 20, 1866:

We claim the cloth coated with rubber, in the manner and by the means herein-before described, as a new fabric or article of manufacture.

2,264.—Die for making Lamp-tops, Rivets, etc.—Charles D. Leet, Dexter Smith, Joseph M. Hall, and Charles K. Farmer, Springfield, Mass., assignees by mesne-assignments of Luther C. White, Meriden, Conn. Patented Sept. 7, 1852:

I claim the combination of the annular die, supporting punch or mandrel, and presser, substantially as set forth.

2,265.—Dough-kneader.—John C. Loveland, Springfield, Vt. Patented January 16, 1866:

I claim, 1st, The combination of the grooved, fluted, or irregular surfaced rollers, B and D, constructed substantially as described with each other and with the frame, A, in which they work, as and for the purpose herein set forth.

2d, The combination with the rollers, B and D, and with the frame or supports, A, of the machine of a pair of inclined aprons or tables, K, substantially as described and for the purpose set forth.

3d, The combination of the disk, M, with the roller, B, aprons, K, and supports or frame, A, of the machine, substantially as described and for the purpose set forth.

2,266.—Harvester.—[Div. A.]—William K. Miller, Canton, Ohio. Patented February 8, 1859:

I claim, 1st, A frame composed essentially of a coupling or drag-bar and a brace, which are hinged to the main frame at two points and connected in the line of the hinges, and furnished with lugs by which they may be united to the shoe at two points, substantially as described.

I also claim, in combination with a yielding coupling arm and brace, an intermediate lug bolted to said frame, and projecting therefrom at such point as to make it capable of being united to a lug placed at the heel of the shoe, substantially as described.

2,267.—Harvester.—[Div. B.]—William K. Miller, Canton, Ohio. Patented February 8, 1865:

I claim, 1st, The short finger-beam hinged to the coupling arm or brace, so that said finger-beam may be raised up and folded to the rear in line with the driving wheels, substantially as and for the purpose described.

I also claim so constructing and arranging the hinged or pivoted point on which the finger-beam is thus folded backward, as that the outer or free end of said finger-beam in its folded position may conform to the inequalities of the ground over which it is drawn, and independent of the vertical movement of the machine, substantially as described.

2,268.—Harvester.—[Div C.]—William K. Miller, Canton, Ohio. Patented February 8, 1859:

I claim, 1st, A draw or coupling-bar hinged to the main frame, in combination with an adjustable hinge-piece and one or more setting or tightening bolts, substantially as described.

I also claim a yielding coupling-arm, made of two or more pieces or parts, in combination with a pivot and tightening bolts, for adapting one part to the other part thereof.

I also claim making the hinge-piece adjustable for the purpose of raising or lowering the points of the fingers or guards, substantially as described.

2,269.—Harvester.—[Div. D.]—William K. Miller, Canton, Ohio. Patented Feb. 8, 1859:

I claim the combination of a supporting-shoe hinged by its lugs to corresponding lugs on an adjustable hinge-piece, which latter is in turn hinged or pivoted to the yielding connection, by which the progressive movement of the finger-beam is controlled, substantially as described.

2,270.—Harvester.—[Div. E.]—William K. Miller, Canton, Ohio. Patented Feb. 8, 1859:

I claim so constructing and arranging the cutting apparatus of a harvesting machine and its connections with the main frame as that it may be converted from a front to a rear cutting machine by transposing said parts, without taking from or adding to the machine any other parts or pieces than those which constitute the cutting apparatus in either of its positions, substantially as described.

2,271.—Attaching Springs to Wagons.—[Div. A.]—Charles S. Martin, Milwaukee, Wis. Patented Feb. 9, 1864:

I claim a device for suspending and securing india-rubber springs by or under the hind axles of wagons, substantially as and for the purpose set forth.

2,272.—Wagon Spring.—[Div. B.]—Charles S. Martin, Milwaukee, Wis. Patented Feb. 9, 1864:

I claim the spring-bar, A, and rods, B, B, when used for the purpose of sustaining the load on the hind axle of a wagon, in combination with the india-rubber springs, F, substantially in the manner set forth.

2,273.—Horse Hay-fork.—Squire Raymond, Venice, N. Y. Patented Nov. 11, 1862:

I claim, 1st, The combination of the fork-arms, D, D', turning or opening at their extreme upper end, and the levers, E, E', constructed and operating substantially as described.

2d, The pulleys, A, G and H, arranged and operating in combination with the rope F, substantially as described, for the uses and purposes mentioned.

3d, The fork arms, D, D', the levers, E, E', with the extension, g, all used in combination with the rope, F, and cord, J, arranged as and for the purpose set forth.

2,274.—Carpenter's Bench Plane.—Wing H. Taber and Thos. R. Abbott, assignees of W. H. Taber, Lowell, Mass. Patented Feb. 28, 1865:

We claim, 1st, The mechanism whereby the cutting edge of the bit is adjusted with respect to the face of the plane by springing the iron upon its bed in the plane-stock in the manner and by the means substantially as described.

Also, adjusting the inclination of the cutting bit with respect to the face of the plane by means of the adjustable bed, G, when used in combination with the clamping mechanism, substantially as described.

2,275.—Steam Drilling Machine.—Joseph W. Fowle, Boston, Mass. Patented March 11, 1851, and extended:

I claim a drilling engine in which the drill has an intermittent rotary movement, or a progressive feed movement, or both a rotary and feed movement, the attachment of the drill directly to the cross-head of the engine or to the piston, or an elongation therefrom, in such manner that the drill is driven by the direct pressure of the motor upon the piston.

2,276.—Vacuum Apparatus for treating Diseases.—Alfred F. Jones, Lexington, Ky. Patented Sept. 13, 1864:

I claim the use of the means above set forth, consisting of a receptacle, A, in combination with a cape, e, or its equivalent, for rendering such receptacle air-tight when to be used for inclosing any portion of the human body, substantially in the manner and for the purpose above described.

2,277.—Manufacture of Skirt Wire.—The Silver Skirt and Wire Manufacturing Company, assignees of T. S. Sperry, New York City. Patented March 7, 1865:

We claim skirt wire protected wholly or partially by metal wire, substantially as and for the purpose described.

2,278.—Machine for channeling Stone.—Thomas Ross, Middlebury, John B. Reynolds, R. Barrett, and A. T. Merriman, assignees by mesne-assignments of John Taggart, Rutland, Vt. Patented Dec. 4, 1855:

We claim, 1st, A machine consisting of drills arranged in one or more gangs and also of mechanism for guiding such gang or gangs of drills, and imparting thereto or causing to be imparted thereto reciprocating movements or the same and longitudinal movements, whereby such gang or gangs when applied to stone may be caused to cut or drill one or more grooves therein, substantially as described.

We also claim the combination of one or more standards, U, U, or the equivalent thereof, with the drills or the gang or gangs thereof and machinery for guiding and operating the same, such standard or standards being to rest in the groove or grooves in which the drills may be in action, and being for the object or purpose as herein-before explained.

2,279.—Clover and Grass-seed Harvester.—Benjamin F. Wright, assignee by mesne-assignments of Thomas S. Steadman, Springfield Township, Ohio. Patented May 23, 1854:

I claim, 1st, In combination with the main frame of a harvester, an axle upon which the cutters driving-wheel revolves, that derives all its connection with the frame through one end, and which end does not cross a vertical plane parallel with and touching the side of this frame nearest to it, a plate from which this axle projects, and a holding mechanism that holds this plate and frame together, and prevents any essential variation in the distance between this axle and the cutters driving pinion-shaft, or in their parallelism while the frame is being raised or lowered in respect to this axle, substantially as and for the purpose set forth.

2d, In combination with the main frame of a harvester, I claim an axle upon which the cutters driving-wheel revolves, that derives all its connection with the main frame through one end, and which end does not cross a vertical plane, parallel with and touching that side of this frame nearest to it; and a plate from which this axle projects, a holding mechanism that prevents any essential variation in the distance between this axle, and the cutters driving-pinion shaft or of their parallelism, while the main frame is being raised or lowered in respect to this axle; and another holding mechanism by which the attendant is enabled to have this main frame held at different hights in respect to this axle, substantially as and for the purpose set forth.

3d, In combination with the main frame of a harvester, I claim an axle-plate which is connected with one end of the axle of the cutters driving-wheel; said plate being wholly between the plane of said wheel, and a plane parallel with and touching that part of said frame nearest to said wheel; and a holding mechanism which prevents any movement of this plate other than its movement in the arc of a circle concentric to the axis of the shaft of the cutters driving-pinion; and a holding mechanism having one portion further forward than the axle of the cutters driving-wheel, and another portion further back than said axle, between each of which and the frame is a portion of said plate, and by which said plate is held to the frame while it is being raised or lowered in respect to said axle, substantially as and for the purpose set forth.

EXTENSIONS.

8,904.—Smut-machine.—John M. Earls, Troy, N.Y. Letters-Patent, dated April 27th, 1852:

I claim, 1st, The projecting screen chambers, in combination with the arrangements for separating the rubbing-ch mber from the fan-chamber, whereby the grain is prevented from being affected by the blast from the fan-chamber while it is passing through the rubbing-chamber, and is only brought in contact with the current of air where it ascends to take away the chaff and other impurities, substantially as herein set forth.

2d, In combination with the scouring surfaces, I claim the beating forks, for the purpose of beating the grain and breaking the hulls while falling from the rubber to the scourers, whereby the berries are more effectually cleaned from adhering impurities, as herein set forth.

8,929.—Machinery for grinding and polishing Saw-blades, etc.—Wm. Southwell, West Cambridge, Mass. Letters-Patent dated May 4th, 1852:

I claim, 1st, The combination of two grindstones, or their equivalents, revolving in the direction herein made known, for the purpose of grinding or polishing two sides of a saw, or other article, simultaneously, with a reciprocating frame, or its equivalent, for the purpose of holding the article being ground or polished, whereby the tendency of either stone to move the article is counteracted by the action of the other stone, and the same force is thereby required to reciprocate the article in either direction, as described.

2d, The combination of the right and left-hand screws, carriers and nuts for said screws, movable pedestals or boxes, together with the cross-shaft, worms, worm-wheels, and handles, substantially as set forth, for the purpose of moving two grindstones, or their equivalents, simultaneously against opposite sides of an article being ground or polished, as described.

3d, I do not claim giving an automatic transverse motion to grindstones; but what I do claim is, the arrangement of the screws, mitre wheels, handles, eccentric boxes, and movable frames, substantially as herein described, whereby I am enabled at any time to move the grindstones, or their equivalents, entirely across the machine for the purposes set forth, without interfering with the automatic traversing motion which is given to the said stones irrespective of their precise position with reference to the either saw frame, or either saw, or other articles fixed in said frames.

4th, The arrangement in the same machine of two sets of reciprocating frames, either of which can be stopped without affecting the other, and a carriage, whereby the grindstones can be caused to move from one frame to the other, by which arrangement one saw can be ground or polished while another is being adjusted into place.

8,920.—Electro-magnetic Alarm Bell.—Moses G. Farmer, Salem, Mass. Letters-Patent dated May 4th, 1852:

I claim as my invention the combination substantially as herein set forth of the electro-magnet and armature (or its electro-magnetic equivalent) with the falling ball or spring, and the detents, and the lifting cam, or its equivalents, so arranged that when the ball is supported by the armature a slight force only of the electro-magnet is required to trip the ball, which ball, in falling, acquires sufficient momentum to produce much greater mechanical effects than the magnet alone, the velocity of the ball in falling being still further accelerated by the force of a spring, if desired. The power thus obtained I use in the manner and for the purpose herein described.

8,952.—Iron Safe.—William Alford and Jno. D. Spear, Southwark, Pa. Letters-Patent, dated May 18th, 1852:

We claim the application of chalk, or whiting, which has been subjected to the action of acids, and has been partially deprived of its carbonic acid; the material which we use being, in fact, the waste or residual matter left from the manufacture of what is called "mineral water," after chalk or whiting has been subjected to the action of acids for the purpose of expelling a portion of its carbonic acid; this residual matter consisting substantially of the substances named in the analysis before referred to, in the construction of double iron chests or safes, in the manner above described, or in any other manner substantially the same.

8,932.—Speaking Tube.—Thomas J. Woolcocks and William Ostrander. Letters-Patent dated May 4th, 1852:

We claim the combination of an alarm-valve, with a speaking tube or pipe, in the manner and for the purpose substantially as set forth.

DESIGN.

2,331.—Handle of a Spoon.—Julius L. D. Sullivan, Somerville, Mass.

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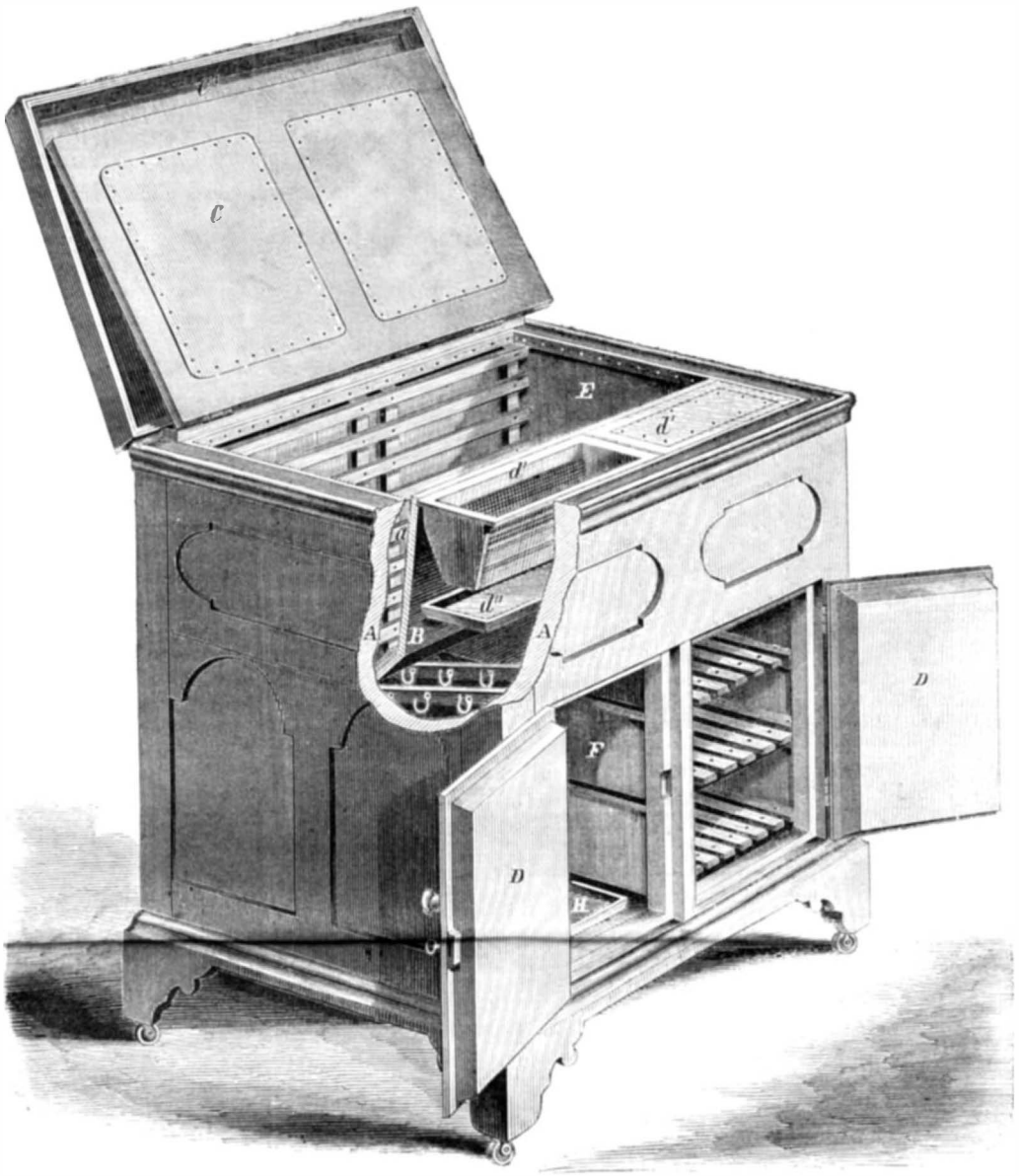
The Esquimaux Refrigerator.

It is singular that, with the experience of our armies in the field, so long a time should have elapsed before the use of an outside resisting medium to caloric should have been adapted to the common refrigerator. We well remember the difference between the temperature of water carried in the common tin canteen, unprotected, and that in a similar canteen covered with woolen cloth, or felt. While the one absorbed the rays of the sun and collected heat from the atmosphere, the water in the other was deliciously cool at all times. The improvement which is the subject of the illustration is, in part, an adaptation of this device to an ice chest. This chest seems to be equally well adapted to the preservation of substances from the action of frost or from heat. The chest is composed of wood for the outer shell, covered—sides, top, and bottom—with woolen cloth or felt. The inner shell is of wood or metal (zinc, for instance), with an air space between. In the illustration, A is the shell or outer wall; B the inner wall, and *a* the air space between the two. The top is closed with a hinged lid, C, and a cover, C′. The lid, C, may be made with a double wall inclosing an air space. This lid is so constructed and edged with cloth or felt as effectually to exclude *warm air from the ice* box, E. The doors in front, D D, are made in the same manner for the same purpose. The ice receptacle, E, occupies nearly the entire horizontal area of the upper portion of the chest, and has a bottom inclining to the rear, that any moisture may be carried off by a pipe in the rear portion (not shown). The cooling apartments are thus kept perfectly dry. These are separated by a vertical partition, and furnished with shelves and hooks. This partition is composed of two walls inclosing an air space. A part of the front upper portion of the chest contains two narrow boxes, *d′ d′*, for receiving charcoal for purifying the air. Beneath them are shallow pans, *d″*, to receive any dust that may fall from the boxes. The pan, H, at the bottom of the refrigerator may also be filled with charcoal. The lid, C, when closed, cuts off all communication between the ice box and the refrigerating chambers, and between them and the outer air. By separating the different compartments of the refrigerator with double walls, inclosing air spaces, much more perfect insulation is produced than with single walls, and by the covering of the chest with flock, felt, or woolen cloth, the heat of the external air is effectually excluded.



BUNN'S ESQUIMAUX REFRIGERATOR.

It is known that some of the odorous gases of meats, etc., are lighter than common air, and must rise. In this refrigerator they must pass through the open-work purifiers, *d′ d′*, and there be deprived of their odors. The inclined bottom of the ice box serves two purposes—one the facilitation of drainage and the other exposing a larger surface of ice to the action of the air. The gases which rise are purified by the charcoal in the upper boxes, and those which fall are purified by the charcoal box, H, at the bottom, thus keeping the air in the refrigerating chambers at all times pure and sweet. The arrangement for drawing off the moisture insures dryness, and the construction of the ice box, coolness. The opening of one chamber does not disturb the temperature of the other, their isolation being perfect by means of the double partition.

This appears to be as near perfect as a refrigerator, and also as a winter receptacle for articles liable to be injured by frost, as any we have yet seen. It possesses many advantages not found in others, among which may be mentioned its felt covering and its system of double partitions. Being built on scientific principles and in accordance with natural laws, it promises to fulfill its objects in a very satisfactory manner.

Patented May 9, 1865. For further information address L. D. Bunn, patentee, Morristown, N. J. The entire patent is for sale, except the States of New Jersey, Massachusetts, and Kentucky, which have been sold.

Asbestus.

A correspondent at L'Original, C. W., sends us a specimen of asbestus, stating that there is a "mountain of it" in his section. He desires to know if it possesses any commercial value, and thinks it might be used in the manufacture of paper. We do not believe pulp can be made from this mineral. It is used somewhat as a filter for chemical purposes, but beyond this its value is slight. It has the quality of resisting the action of fire, being one of the most incombustible of substances, and has been used to manufacture a coarse cloth which has been wrought into protecting garments for firemen. It was formerly employed as a lining for fire-proof safes, but its use for this purpose has been abandoned, other substances being found superior. Although indestructible by fire, it is a conductor of heat, which rendered it useless as a resisting medium for safes. It is found in large quantities on Staten Island, New York Bay, of much finer quality than the specimen sent to us from Canada.

Ballooning in England.

A newly invented guiding and propelling balloon, called the *Zodiac*, made by Mr. Jackson, of Derby, ascended from Cremorne Gardens a short time ago. Mr. Jackson claims to have attained the power so many have sought for in vain, of guiding the balloon, and even propelling it when the wind fails. The aeronaut sits on a long slender framework over the ordinary car, and the turning of a small crank sets in motion a long oar projecting from either side, spiked with large goose feathers, and simultaneously a cross of feathers at the front end of the frame, which, when in motion, resembles the toy windmill children run with in the street. Behind the voyager's seat, and easily guided, is a large rudder of goose feathers. The oars at the side may be worked singly or together. The balloon started briskly, and rapidly rose high, the descent being made near Epsom, the aeronaut returning by nine o'clock. We cannot say whether the expectations of the inventor were realized in guiding and propelling the machine, as we had no opportunity of observing its course.—*London Mechanics' Magazine.*

STEEL MADE FROM IRON SCRAPS—Take iron scraps in small pieces, put 40 lbs. in a crucible, with 8 ounces of charcoal, and four ounces of black oxide of manganese; expose the whole one hour and a half to a high heat, and run into molds.

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